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1. **Vainio, Edv. A.**, Lichenographia Fennica II. Baeomyceae et Lecideales. Pag. 1—340 cum mappa geographica et explicatione ejusdem.

LICHENOGRAPHIA FENNICA II.

BAEOMYCEAE

ET

LECIDEALES

SCRIPSIT

EDV. A. VAINIO

HELSINGFORSIAE 1922.

EX OFFICINA TYPOGRAPHICA SOCIETATIS HEREDUM J. SIMELII.

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Trib. 14. **Baeomyceae** Vain.

Thallus squamosus aut crustaceus (aut foliaceus), gonidia continens viridia, globosa aut ellipsoidea. Apothecia stipitata, stipite bene evoluto aut raro brevi aut subdeficiente. Excipulum gonidia continens aut gonidiis destitutum. Asci angusti, membrana tenui. Sporae decolores, breves, simplices aut 1—3-septatae.

Baeomyces paemosus Krempelh., Beitr. Lich. Süds. (1873) p. 96, gonidiis glomerulosis, aeruginosis instructus, ad *Collemaceas* pertinet. *Icmadophila*, inter *Lecaniam* et *Placopsin* intermedia, ad *Lecanoreas* attribuenda est. *Baeomyceae*, habitu praesertim genere *Glossodia Helvellaceis* similes, tribum lichenisatam *Helvellacearum* constituunt. *Gomphillus* Nyl., gonidia globosa viridia in thallo mycelioideo continens et apotheciis jodo non reagentibus instructus, minus complete lichenisatus et inter fungos *Geoglosso*, ad tribum *Geoglossearum*, item sub *Helvellaceis* dispositarum, pertinenti, affinis est. — *Baeoderma Madagascareum* (Nyl.) Vain. (*Heterodea Madagascarea* Nyl.), thallo facie externa sub simile *Cl. foliaceae* var. *alcicorni*, apotheciis baeomycoideis, immarginatis, stipite brevi, solido, cartilagineo margini thalli affixis, sporis simplicibus instructum, ad *Baeomyceas* pertinet.

1. **Baeomyces** Pers.

Ust. Neue Ann. 1 St. (1794) p. 19 (p. p.); Ach. Lich. Univ. (1810) p. 108, 572; Nyl. Syn. Lich. p. 175 (p. p.); Vain. Etud. Lich. Brés. II p. 3; Reinke Abh. Flecht. III (Jahrb. Wissensch. Bot. XXVIII, 1895) p. 131; Zahlbr. Ascol. (1905) p. 140. *Sphyridium* Flot. in Jahresb. Schles. Gesellsch. Naturk. (1842) p. 196 (em.). *Tubercularia* Web. in Wiggers Prim. Fl. Hols. (1780) p. 87 (*B. roseum* et *B. rufum* includens, conf. Th. Fr. Lich. Suec. II p. 329, Zahlbr. Hedwigia 1892 p. 37), nomen rectius, sed ab aliis, quam Kuntze in Rev. Gen. Plant., denuo nondum adhibitum.

Thallus squamosus aut crustaceus. Apothecia pallida aut subcarnea rufescentiave. Excipulum lecideinum, gonidiis destitutum, stipitatum aut substipitatum. Sporae 8-nae, decolores, ellipsoideae oblongaeve aut fusiformes, simplices aut 1-septatae. „Conidangia tuberculis thalli inclusa. Sterigmata sat crebre articulata, articulis numerosis. Conidia breviter cylindrica.“ (Nyl. in Cromb. Mon. Lich. I p. 109, Nyl. Lich. Paris p. 11).

Apothecia perennia, nec annua, ut a Th. Fr. l. c. p. 327 indicatur (conf. Vain. Medd. Soc. F. Fl. Fenn. Förh. 1898 p. 79). Sec. Schaer. Enum. Lich. Eur. p. XVI apothecia quotannis pereunt et redeunt in *B. roseo*, quod certe erratum est.

Sect. 1. **Phloeopus**. Stipes apothecii strato medullari gonidia continente instructus. Pag. 4.

1. **B. placophyllus** Wahlenb. Thallus laciniatus, ambitu foliaceo-effiguratus. 4.

Sect. 2. **Gymnopus**. Stipes apothecii saltem parte superiore zona gonidiali destitutus. 6.

a. **Eubaeomyces**. Apothecia peltata aut subpeltata.

† Thallus KHO lutescens.

2. **B. rufus** (Huds.) D.C. Apothecia disco rufescente, KHO non reagente. 6.

†† Thallus KHO lutescens deindeque rubescens.

3. **B. carneus** Floerk. Apothecia disco pallido aut cinereo-pallescente, KHO lutescente deindeque rubescente. 8.

4. **B. fuscoringens** Vain. Apothecia disco fusco rufescenteve, KHO non rubescente. 10.

β. **Sphyridium**. Apothecia subglobosa aut tuberculiformia.

5. **B. roseus** Pers. Apothecia rosea, pruinosa, cavernosa. 11.

Sect. 1. **Phloeopus** Vain.

Lich. Ins. Philipp. III (Ann. Acad. Scient. Fenn. XV, 1821) p. 57.

Stipes apothecii strato medullari gonidia continente instructus.

1. **B. placophyllus** Wahlenb.

in Ach. Meth. Lich. (1803) p. 323, tab. 7 f. 4, Lich. Univ. (1810) p. 574, Syn. Lich. (1814) p. 281; Wahlenb. Fl. Lapp. (1812) p. 449; Schaer. Enum. Lich. Eur. (1850) p. 183; Nyl. Syn. Lich. p. 180, Lich. Scand. (1861) p. 48; Tuck. Syn. North Am. Lich. II (1888) p. 6; Cromb. Mon. Lich. Brit. I (1894) p. 111; Zahlbr. Ascol. (1905) p. 141 fig. 66. *Sphyridium placophyllum* Th. Fr. Lich. Arct. (1860) p. 177, Lich. Scand. II (1874) p. 327; Arn. Lich. Tirol XXI (1880) p. 130, XXX (1897) p. 22; Krabbe Bot. Zeit. 1882 p. 79, 93, tab. II f. 3, tab. III f. 1.

Exs. Rabenh. Lich. Eur. Exs. XXIV (1862) p. 663. — Arn. Lich. Exs. (1871) n. 448 a—c. — Mig. Crypt. Germ. Exs. (1902) n. 21 (sec. Lynge Ind. Lich. Exs. II p. 32). — Havaas Lich. Norv. Exs. (1905) n. 280.

Thallus laciniatus, laciniis confluentibus, ambitu foliaceo-effiguratus, medio subcrustaceus plicatusque, pallidus aut medium versus albidus vel glaucescens cinerascensve, KHO

lutescens. Apothecia peltata, stipitata, zona gonidiali stipitis areolata aut partim subcontinua, areolis prominentibus, dispersis aut contiguis, disco testaceo-rufescente.

Distr. Ad terram arenosam et rarius turfaceam in regionibus coniferarum sat frequenter et pluribus locis in reg. betulina et alpina partium occid. Lapponiae sec. Norrl. (Ber. Torn. Lappm., 1873, p. 318). L In.: Ad limitem regionis subalp. in monte Ruoptuinvaara (Vain. Adj. Lich. Lapp. II p. 99). L Im.: Reg. alp. inf. montis Eveslog-tschor (A. O. Kairamo). L Pon.: Ponoï (N. I. Fellman, Nyl. Lich. Lapp. Or. p. 108). L Kem.: Muonioniska (Norrl.). Ob.: „Lapp. Tornensis“ (Edvin Nylander). Kuus.: Reg. subalp. montium Mäntyunturi (Vain.), Nuorunen (F. Silén), Iivaara, reg. conif. mixt. ad Paanajärvi et in ericeto prope Manninen in reg. infralapponica (Vain. l. c.). K Ker.: Reg. subalp. montis Kivakka (Vain. l. c.). K Vien. occ.: Ad Luvajärvi in reg. infralapp. et in pineto prope Tscholkka in reg. Alni glutinosae (Vain. l. c.).

Thallus sorediis destitutus, saepe plagas latas (—60 mm lat.) formans, ambitu crenato crenulato, subtus albidus pallidusve, adnatus aut ad ambitum adscendens, rhizinis concoloribus, sparsis, ramosis, circ. 3—5 mm longis, strato corticali haud evoluto, zona gonidiali crasso, hyphis leptodermaticis, crebre contextis, 0.003—0.002 mm crassis, partim in superficie verticalibus. Stipes bene compressus, sed saepe demum canaliculatus vel longitudinaliter convolutus, quare teres videtur, intus solidus aut interdum demum partim longitudinaliter fissus, in zona gonidiali lateris convexi crebre irregulariter contextus, intus chondroideus et ex hyphis formatus pachydermaticis, longitudinaliter dispositis, conglutinatis, cavitatibus cellularum 0.002—0.0015 mm latis, in latere concavo gonidia parum continens. Apothecia 1.5—4 mm lata, sat tenuia, depresso-convexiuscula, saepe demum medio impressa plicata, margine subtus reclinato revolutove, solitaria aut nonnulla conferta in apice ejusdem stipitis. Excipulum chondroideum, solidum aut interdum demum intus fissum. Hypothecium decoloratum. Hymenium circ. 0.090 mm crassum, jodo non reagens. Paraphyses in KHO laxae cohaerentes, crass. 0.0005 mm, apice leviter incrassatae, simplices aut apice leviter ramosae. Asci subcylindrici. Sporae 8-nae, distichae aut monostichae, oblongae, apicibus obtusis, simplices, long. 0.008—0.012 („—0.015“), crass.

0.002—0.003 mm (,—0.004“ mm sec. Nyl.). *Acidum atranoricum* continet sec. Zopf (Liebig's Ann. d. Chem. 300 p. 345, Flechtenst., 1907, p. 404). *Gonidia globosa*, diam. 0.008—0.016 mm, tantum simplicia visa, membrana tenuissima.

Obs. *Baeomyces pachypus* Nyl., Syn. Lich. p. 182, sec. Th. Fr. Lich. Scand. II p. 327 ad hanc speciem pertineret, sed stipitibus haud compressis ab ea facile distinguitur. *Baeomyces* γ. *Phloeopodium* Stizenb., Beitr. Flechtensyst. (1862) p. 166, podetiis corticatis descriptum, spectans ad sect. B in Nyl. Syn. Lich. p. 182 (*B. pachypus* Nyl. et *B. trachypus* Nyl.), nec *B. placophyllum* includens, alio modo limitatum est, quam sect. *Phloeopus*.

Sect. 2. *Gymnopus* Vain.

Lich. Ins. Philipp. III (1821) p. 58.

Stipes apothecii saltem parte superiore strato chondroideo denudato zonaque gonidiali destitutus.

2. *B. rufus* (Huds.) D.C.

Fl. Fr. II (1805) p. 342; Wahlenb. Fl. Lapp. (1812) p. 449; Ach. Syn. Lich. (1814) p. 280; Nyl. Syn. Lich. p. 176 p. p., tab. I f. 12, tab. VI f. 12—14, Lich. Scand. p. 48 p. p., Fl. 1877 p. 463, Lich. Par. (1896) p. 26. *Lichen rufus* Huds. Fl. Ang. (1762) p. 443. *Lichen cinereofuscus* Jacq. En. Pl. Vindob. (1762) p. 188, 299 (sec. Kremp. Gesch. Lich. III p. 209). *L. byssoides* L. Mant. (1767) p. 133 (Vain. Rev. Lich. Linn. p. 1). *Sphyridium byssoides* Th. Fr. Lich. Arct. (1860) p. 177 p. p., Lich. Scand. II (1874) p. 328 p. p.; Arn. Lich. Fränk. Jur. (Fl. 1884) p. 144 p. p., Lich. Münch. (1891) p. 69 p. p. *Baeomyces* Schaer. Enum. Lich. Eur. (1850) p. 183; Tuck. Syn. North Am. Lich. II (1888) p. 6. *Sphyridium fungiforme* Flot. l. c. (1842) p. 196; Koerb. Syst. Lich. Germ. (1855) p. 273 (forsan etiam *Lichen ericetorum* β. *fungiformis* Poll. Hist. Pl., 1777, *Tubercularia fungiformis* Wigg. Prim., 1780, n. 959, *Cladonia* Schrad. Spic., 1794, p. 106, *Stereocaulon* Schaer. Spic. VI, 1833, p. 272 p. p.); Krabbe Bot. Zeit. 1882 p. 68, 93, tab. II f. 1, 3, tab. III f. 3.

Exs. Fr. Lich. Suec. Exs. V (1825) n. 146. — Nyl. Herb. Lich. Par. I (1855) n. 27. — Rabenh. Lich. Eur. Exs. II (1855) n. 26, XIV (1858) n. 413. — Stenh. Lich. Suec. Exs. n. 135. — Hepp Flecht. Eur. III (1860) n. 481 (in herb. meo). — Arn. Lich. Exs. (1861) n. 165, (1868) n. 398. — Fellm. Lich. Arct. (1864) n. 22, 23. — Cromb. Lich. Brit. Exs. (1874) n. 12. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 715. (P. p. sec. cit.)

Thallus crustaceus aut raro subsquamulosus, areolatus, areolis convexis aut planis, adnatis aut raro adscendentibus,

saepe parce sorescens, glaucescenti- aut pallido-albidus cinerascensve, KHO lutescens deindeque fulvescens. Apothecia peltata aut subpeltata, stipitata aut raro subsessilia, stipite compresso aut fere terete, costato, pallido nudoque aut raro parte inferiore zona gonidiali areolata obducto, disco depresso-convexo, rufescente fusciscenteve aut raro pallescente, KHO non reagente.

Distr. Praesertim ad terram arenosam in ericetis, raro ad lignum et muscos putridos, saepe etiam basin versus in lateribus rupium saxorumque graniticorum et calcariorum crescit. Sat frequens ceterum toto territorio („etiam in Lapponia in regionibus coniferarum, nec rarus in regione betulina et alpina usque ad Kilpisjärvi“ sec. Norrl. Ber. Torn. Lappm. p. 317, Vain. Adj. Lich. Lapp. I p. 98, Fellm. in Nyl. Lich. Lapp. Or. p. 108), sed in Lapponia Kuollaënsi forsitan minus frequens. Etiam collectionibus expeditionis Vegae in Sibiria arctica deest. LIm.: Ad Imandram (N. I. Fellman) et Liehkvar ad lac. Kopustjavr (A. O. Kairamo). LMur.: Ad Varsina (Nyl. Lich. Lapp. Or. p. 108).

Thallus plagas saepe latas formans, squamis areolisque 0.3—1 mm latis, circ. 0.140 mm crassis, vulgo contiguis, difformibus aut rotundatis, interdum margine crenulatis, subtus albidis, in fissuris saxorum et locis mollibus rhizas — 7 mm longas, ramosas emittens, strato corticali haud evoluto, zona gonidiali crassa (circ. 0.100—0.090 mm), hyphis leptodermaticis, 0.003—0.002 mm crassis, crebre irregulariter contextis. Stipes long. — 6 mm, haud convolutus, intus solidus, chondroideus, ex hyphis formatus conglutinatis, praesertim medium versus membranarum bene chondroideo-incrassatis, strato interiore membranae tubulum plus minus distinctum formante, cavitate cellularum vix 0.001 mm lata. Apothecia circ. 1—2.5 mm lata, sat tenuia, depresso-convexiuscula, vulgo subsolitaria, margine subtus reclinato revolutove. Excipulum chondroideum, solidum, hyphis irregulariter contextis, decoloribus, in superficie radiantibus, tenuibus, sat leptodermaticis, item conglutinatis. Hypothecium superne anguste pallidum. Hymenium circ. 0.080—0.090 mm crassum, totum pallidum, epithecio intensius colorato, jodo non reagens. Paraphyses in KHO laxae cohaerentes, crass. 0.001—0.0015 mm, simplices aut apice ramulosae furcatae. Asci cylindrici. Sporae 8-nae, distichae aut monostichae, oblongae,

apicibus obtusis, simplices, long. 0.006—0.010, crass. 0.0025—0.003 mm, sec. Nyl. long. —0.012, crass. —0.004 mm. Gonidia globosa, simplicia, diam. 0.010—0.008 mm, membrana tenuissima, sed distincta, chromatophoro centrali, difformi, vacuolo laterali. Conidia „ellipsoidea, long. circ. 0.004—0.005, crass. 0.001 mm, sterigmata elongata, articulis numerosis“ (Flagey Fl. Lich. Fr.-Comt. II, 1886, p. 338).

F. subsquamulosa Nyl. (Fl. 1877 p. 463), areolis thalli partim adscendentibus (KHO lutescentibus). Insignis, sed parum constans.

In latere saxi in Pihlajavesi in Tb. (Vain.). Ad terram arenosam prope Haapajärvi in Pieksämäki in Sb. (Vain.). Ad plantas destructas in rupe in Kotikallio Hoglandiae („B. carneus“ M. Brenner Bidr. Hög. Lafv. p. 20 p. p.).

F. corticata Vain. Stipes parte inferiore plus minus late areolato-corticatus. Supra plantas destructas ad basin lateris rupis prope Fredriksberg Helsingforsiae (H. Lindberg).

Obs. Variationes sequentes deflexus vel status diversos hujus speciei indicant: *Biatora byssoides* b. *rupestris* Fr., Lich. Eur. Ref. (1831) p. 258 (*Baeomyces rupestris* Pers. in Ust. Ann. d. Bot. 7 St., 1794, p. 19), saxicola. *Baeomyces rupestris* γ. *B. lignorum* Ach., Meth. Lich. (1803) p. 322, lignicola. *Lichen ericetorum* γ. *parasiticus* Retz., Fl. Scand. Prodr. (1779) p. 224, muscicola. *Baeomyces rupestris* β. *B. byssoides* Ach., Meth. Lich. (1803) p. 321 (*Lichen byssoides* L. Mant., 1767, p. 133), sec. herb. Ach. partim stipitibus sursum subramulosis apotheciisque aggregatis, thallo KHO lutescente. *Baeomyces rufus* var. *sessilis* Nyl., Syn. Lich. p. 177 (Lich. Lapp. Or., 1866, p. 108, Fellm. Lich. Arct., 1864, n. 23 e Varsina, Norrl. Bidr. Sydöstr. Tav. Fl., 1870, p. 174, Vain. Fl. Tav. Or., 1878, p. 93), sec. specim. orig. e Meudon (Lich. Paris, 1896, p. 26), apotheciis subsessilibus, cinerascenti-carneis, haud bene evolutis, thallo KHO lutescente, demum fulvescente.

3. *B. carneus* Floerk.

Deutsch. Lich. VIII (1821) p. 16, n. 160 (videas infra); Nyl. Fl. 1877 p. 462; Vain. Adj. Lich. Lapp. I (1881) p. 98. *B. rufus* var. *carneus* Nyl. Syn. Lich. p. 177 p. p., Lich. Scand. (1861) p. 48 (excl. *B. fusco-rufescente*); Norrl. Bidr. Sydöstr. Tav. Fl. (1870) p. 174 p. p., Ber. Torn. Lappm. (1873) p. 317 p. p., Fl. Kar. Oneg. II (1876) p. 11 p. p.; Elfv. Ant. Veg. Svir (1878) p. 164 p. p. *Sphyridium carneum* Flot. Lich. Fl. Siles. (1849) p. 44; Krabbe Bot. Zeit. 1882 p. 75, 93, tab. II f. 4, tab. III f. 2.

Exs. Floerk. Deutsch. Lich. VIII (1821) n. 160 (in herb. Floerk. et herb. Nyl.). — Hepp Flecht. Eur. III (1860) n. 480 (in herb. meo). — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 98.

Thallus squamosus aut rarius partim crustaceus areolatusque, squamis 2—0.2 mm longis, 0.2—0.7 mm latis, planis aut rarius convexis, adscendentibus aut p. p. adnatis, plus minus sorediosus, albidus aut pallidus aut rarius cinerascens, KHO lutescens deindeque rubescens. Apothecia peltata aut subpeltata, breviter stipitata aut subsessilia, stipite compresso aut fere terete, demum leviter costato, pallido nudoque aut raro parte inferiore zona gonidiali areolata obducto, disco depresso-convexo, pallido aut cinereo-pallescente, haud pruinoso, KHO solutionem luteam deindeque crystalli rubra formantem effundente.

Distr. Ad terram arenosam in ericetis, ad saxa et rupes et interdum ad muscos destructos et ligna putrida. N.: Kotikallio Hoglandiae (M. Brenner), Alppila Helsingforsiae (Vain., B. Poppius). Ta.: Nyystölä et Virmaila in Padasjoki (Vain.), Evo (J. P. Norrlin), Tiainen et prope Välluvuori in Korpilahti (Vain.). St.: Kokemäki (A. J. Malmgren). Oa.: Jurva (A. J. Malmgren). Sb.: Pieksämäki (Vain.), Nerkoo in Lapinlahti (O. A. F. Lönnbohm), Kuopio (sec. G. Lång Lich. Sav. bor. p. 7). KOL.: Mjatusova (sec. F. Elfv. Ant. Veg. Svir p. 164). KOn.: Käpselkä (Th. Simming), Kosagora (A. Kullhem). Kb.: Prope pag. Lieksa (Vain.). OKaj.: Sotkamo (A. Chydenius). LIm.: Umba (G. Selin). LTul.: Kuolla (N. I. Fellman).

Thallus plagas usque ad 8 cm latas formans, squamis tenuibus (circ. 0.26 mm crassis), vulgo contiguus, difformibus aut rotundatis, interdum margine crenulatis, subtus albidis, partim rhizinas breviores, ramosas emittens, strato corticali haud evoluto, hyphis leptodermaticis, 0.0022—0.0017 mm crassis, crebre irregulariter contextis, KHO crystalli rubra, acicularia, circ. 0.017—0.006 mm longa formans, strato medullari inferiore gonidiis destituto. Soredia albidia aut rosea. Stipes long. 1.5—0.2 aut fere deficiens, KHO partim lutescens deindeque rubescens, intus solidus, chondroideus, pachydermaticus, cavitatibus tenuissimis, in parte exteriori membranis minus incrassatis et impellucidis. Excipulum chondroideum, solidum. Hypothecium parte superiore anguste pallidum. Hymenium bene evolutum haud visum. Gonidia globosa, simplicia, diam. 0.007—0.012 mm.

4. **B. fuscorufescens** Vain. (n. sp.).

Baeomyces byssoides Schaer. Lich. Helv. Exs. II (1823) n. 32 (in herb. D.C.), haud *Lichen byssoides* L. Mant. (1767) p. 133.

Thallus squamosus aut partim crustaceus areolatusque, squamis 0.2—3 mm longis, 0.2—0.8 mm latis, planis convexisve, adscendentibus aut p. p. adnatis, saepe plus minus sorediosus, albidus aut pallidus, KHO lutescens deindeque rubescens. Apothecia peltata aut subpeltata, stipitata aut raro subsessilia, stipite compresso aut fere terete, demum costato, pallido nudoque aut parte inferiore zona gonidiali areolata obducto, disco depresso-convexo, fuscescente vel rufo-fuscescente aut raro partim rufescente, KHO non rubescente (solutionem subolivaceam effundente).

Distr. Ad terram arenosam et ad saxa rupesque collectus. Ab.: Ad Vanjärvi in Vihti (G. Lång). Ta.: Asikkala (J. P. Norrlin), Evo (G. Lång), Messukylä (P. A. Karsten). KOn.: Valkeamäki (Th. Simming, „B. rufus v. carneus“ in Norrl. Fl. Kar. Oneg. II p. 11). KTranson.: Povjenets (A. Kullhem). Ob.: Aavasaksa (E. Nyl., hb. Nyl. 40309). LKem.: Kätkesuanto in Muonioniska („B. rufus“ in Norrl. Ber. Torn. Lappm. p. 317). LEnont.: Prope Kaaresuanto et Enontekiäinen („B. rufus v. carneus“ in Norrl. l. c.). LTul.: Kuolla (P. A. Karsten).

Thallus plagas usque ad 7 cm latas formans, squamis tenuibus, vulgo contiguis, difformibus aut rotundatis, interdum margine crenulatis, subtus albidis, raro areolatus, partim rhizinas breviores, ramosas emittens, strato corticali haud evoluto, hyphis leptodermaticis, 0.0025—0.0017 mm crassis, crebre irregulariter contextis, KHO demum crystallata rubra, acicularia formans. Stipes long. —5 mm, saepissime brevior, haud convolutus, partim extus KHO lutescens et crystallata rubra formans, intus solidus et chondroideus, pachydermaticus, cavitatibus tenuissimis, in parte exteriori membranis minus incrassatis. Apothecia lat. circ. 0.7—2.2 mm, sat tenuia, depresso-convexiuscula, vulgo subsolitaria, margine interdum conspicuo pallidoque, vulgo excluso aut reclinato. Excipulum chondroideum, solidum, extus KHO sicut thallus reagens. Hypothecium superne anguste pallidum, ceterum decoloratum. Hymenium circ. 0.060 mm crassum, totum pallidum, epithecio intensius colorato, jodo non reagens. Paraphyses in KHO

laxe cohaerentes, crass. 0.001 mm, apicem versus 0.002 mm, simplices aut apice ramulosae. Asci cylindrici, crass. 0.006 mm, membrana tenui. Sporae 8-nae, distichae, oblongae, apicibus obtusis, simplices, long. 0.006—0.011, crass. 0.002—0.003 mm. Gonidia globosa, simplicia, diam. 0.010—0.006 mm, membrana tenuissima, sed distincta, chromatophoro centrali, difformi, vacuolo laterali.

F. vaginata Vain. Stipites parte inferiore late areolato-corticati. Ad terram et rupes in Asikkala, ad Kätkesuanto, Kuolla (supra indicata). Stipites apice ramulosi aut simplices.

F. brachypus Vain. Apothecia subsessilia aut stipite brevissimo (—0.5 mm longo) instructa. In Vihti (supra ind.).

5. *B. roseus* Pers.

Ann. Bot. Ust. 7 St. (1794) p. 19; Ach. Meth. Lich. (1803) p. 321, Lich. Univ. (1810) p. 572, Syn. Lich. (1814) p. 280; Wahlenb. Fl. Lapp. (1812) p. 449; Schaer. Lich. Helv. Spic. I (1823) p. 16, VI (1833) p. 270, Enum. Lich. Eur. (1850) p. 182, t. VI f. 6; Fr. Lich. Eur. Ref. (1831) p. 246; Koerb. Syst. Lich. Germ. (1855) p. 329; Nyl. Syn. Lich. p. 179, tab. VI f. 15—21, Lich. Scand. (1861) p. 48; Th. Fr. Lich. Arct. (1860) p. 176, Lich. Scand. II (1874) p. 329; Krabbe Bot. Zeit. 1882 p. 89, tab. II f. 5, 6; Arn. Lich. Fränk. Jur. (Fl. 1884 p. 141), Lich. Münch. (1891) p. 69; Tuck. Syn. North Am. Lich. II (1888) p. 6; Jatta Fl. It. Crypt. III p. 472; Vain. Lich. Ins. Philipp. III (Ann. Ac. Scient. Fenn. XV, 1921) p. 60. *Lichen Baeomyces* Ehrh. Phytoph. (1780) n. 89; Linn. fil. Suppl. (1781) p. 450. *L. ericetorum* Ach. Prodr. Lich. Suec. (1798) p. 81 (haud Linn. Spec. Pl., 1753, p. 1141, conf. Vain. Rev. Lich. Linn. p. 2).

Exs. Floerch. Deutsch. Lich. V (1819) n. 97. — Schaer. Lich. Helv. Exs. II (1823) n. 31. — Fr. Lich. Suec. Exs. V (1825) n. 145, VIII (1826) n. 230. — Sommerf. Pl. Cr. Norv. II (1836) n. 156. — Hepp Flecht. Eur. I (1853) n. 119. — Nyl. Herb. Lich. Par. I (1855) n. 26. — Rabenh. Lich. Eur. Exs. II (1855) n. 27. — Stenh. Lich. Suec. Exs. n. 57 a, b. — Arn. Lich. Monac. Exs. (1892) n. 306. (Sec. Arn. l. c. et Lyngé Ind. Lich. Exs. II p. 32.)

Thallus crustaceus, continuus, verruculoso-inaequalis (verruculis 0.15—0.1 mm latis, crebris aut contiguis, cinerascens aut albidus), verrucis majoribus (0.3—0.8 mm latis), subglobosis basiue constrictis, dispersis aut sat crebris, albis vulgo inspersus. Apothecia subglobosa, lat. 0.8—4 mm, immarginata aut subtus circa stipitem margine tenui instructa, rosea, tenuiter pruinosa, intus caverna, hyphis laxae contextis impleta, instructa, stipitata, stipite sat tenui, terete, vulgo laevigato, gonidia haud continente.

Distr. Ad terram arenosam et argillaceam et plantas destructas in ericetis et lateribus semitarum et locis apricis crescit. Passim in maxima parte Fenniae et Kareliae Vienaënsis Olonetsensisque. LENONT.: In reg. betulina prope cataractam Pättikkö in territorio Suecico (J. P. Norrlin). LKEM.: „Frequenter in ericetis meridiem versus e Kihlanki (Kolari, Turtola)“ sec. Norrl. Ber. Torn. Lappm. p. 318, Kittilä (E. Nylander), Sodankylä (R. Hult), prope pag. Salla (Vain.) et alibi in Kuolajärvi (E. Nylander). LIM.: Reg. sylv. in alp. Lujauri-uurt, Vaon-bed (A. O. Kairamo). LPON.: Ad promont. Orlov (A. O. Kairamo). KUUS.: In reg. abietina ad Vanttaja (Vain.) et alibi (F. Silén). KVIE. OCC.: Luva-järvi (Vain.). In Ostrobotnia Kajanensi et Karelia bor. passim (Vain. Adj. Lich. Lapp. I p. 99). KON.: „Pluribi frequenter“ (Norrl. Fl. Kar. Oneg. II p. 11). SA.: Luumäki et Lemi (E. Nylander), Juva (A. Kullhem). TA.: Rara in Korpilahti et Luhanka (Vain. Fl. Tav. Or. p. 93), Urajärvi in Asikkala et Evo (Norrl. Fl. Tav. Or. p. 174), Hollola (Vain.). N.: Mäkiinpäällys Hoglandiae (Brenner Bidr. Hogl. Lafv. p. 20). KOL.: Gorki (Elfv. Ant. Veg. Svir p. 164). IK.: Pällilä in Muola (A. O. Kairamo).

Primordia apotheciorum in partibus inferioribus thalli nascentia et postea verrucis thallinis inclusa sec. Krabbe l. c. Etiam conidia verrucis thallinis inclusa sec. Nyl. Syn. Lich. tab. VI f. 20. Aliae verrucae majores alborosellae albaeve „cephalodeae“ a Nyl. nominantur (l. c. p. 179). Interdum thallus verruculis minutissimis solis instructus est. Thallus plagas latas formans, rhiziniis haud evolutis, gonidiis instructus dactylococoides, ellipsoideis, apicibus rotundatis, long. 0.005, crass. 0.003 mm, dilute virescentibus, membrana tenuissima, in jodo parum conspicua (conf. etiam Nyl. Syn. Lich. t. VI f. 17), in parte inferiore etiam *Gloeocapsam* (*G. polydermatica* Kütz. sec. Fünfst. in Engl. et Prantl Nat. Pflanzenf. 180 Lief., 1898, p. 14) abundanter continens, KHO parum aut dilute lutescens, addito CaCl_2O_2 bene lutescens. Discus apotheciorum KHO dilute lutescens, CaCl_2O_2 non reagens. Hymenium circ. 0.090—0.100 mm crassum, jodo dilute caerulescens. Epithecium impellucidum, cinerascenti-pallescent. Paraphyses in KHO laxae cohaerentes, simplices, crass. vix 0.002 mm, apice 0.002 mm. Asci cylindrici, crass. 0.006 mm, membrana tenui. Sporae 8-nae, subdistichae, decolores, fusiformes

aut oblongo-fusiformes, apicibus sat acutis aut subobtusis, rectae, simplices (sec. Th. Fr., Nyl. l. c., t. VI f. 19 variant obsolete dyblastae), long. vulgo 0.016—0.022, crass. 0.0025 mm (sec. Nyl. l. c. long. 0.011—0.026, crass. 0.0025—0.003 mm). Hypothecium decoloratum, in parte superiore hyphis erectis, nec ab hymenio distincte limitatum, inferne (vel perithecium) cavernosum, et in hyphas laxae arachnoideo-contextas, 0.004—0.003 mm crassas, modice aut leviter pachydermaticas dissolutum. Stipes long. 0.5—2 mm, crass. 0.5—1 mm, albidus, KHO parum lutescens, chondroideus, extus impellucidus, intus laceratus et hyphas arachnoideo-contextas parce continens. Conidangia „majuscula, tuberculiformia, cortice thallino albo (demum disrupte) tecta, conceptaculo supra nigricante, tenui; sterigmata multi-articulata, elongata, crass. 0.002—0.003 mm“, conidia „recta, long. 0.005, crass. vix 0.001 mm“ (Nyl. l. c., t. VI f. 20, 21).

Obs. In Fr. Nov. Sched. Crit. I (1826) p. 15 n. 230 mentio fit de formis sequentibus: *B. roseus* b. *coccodes* Fr., qui a Schaer. (Enum. Lich. Eur. p. 183) „stipitibus ventricosis, apice roseis“ describitur. F. 1) *praesens* Fr., „ubique in ericetis obvia, podetiis cylindrico-ventricosis, apice apothecio isidiimorpho“. F. 2) *palustris* Fr., „candida, Lich. frigido similis, locis hieme inundatis“.

Trib. 15. **Lecideales** Vain.

Thallus crustaceus aut squamosus aut raro minute foliaceus, heteromericus aut in statu minus evoluto homoeomericus aut e mycelio gonidiis destituto constans. Stratum corticale haud evolutum aut superne thallum obtegens, cartilagineum, loculis cellularum angustis. Stratum medullare stuppeum. Gonidia in zona supra stratum medullare disposita aut in toto thallo obvenientia, viridia, simplicia aut glomerulosa (raro simul cyanophyceae in parathallis). Apothecia demum thallo adpressa adnatave, aut rarius immersa permanentia, aut stipitata podetiove instructa. Excipulum gonidiis destitutum, cartilagineum aut plectenparenchymaticum, strato medullari stuppeo nullo (perithecium lecideinum) aut raro evoluto (perithecium hemilecanorinum). Paraphyses evolutae, simplices aut rarius ramoso-connexae. Sporae endosporio haud incrassato, sed exosporio interdum (in Rhizocarpo, cet.) gelatinoso-incrassato.

Subtrib. 1. **Cladonieae** Vain.

Thallus vulgo duarum formarum, horizontalis (thallus primarius) et verticalis (podetium). Podetia metamorphosi e stipitibus apotheciorum in thallum verticalem transformata, e superficie aut rarius e latere thalli primarii enata, in primordiis novellis solida, vulgo dein mox fistulosa, raro persistenter solida, stratum myelohyphicum sive stuppeum (stratum medullare exterius), zona gonidiali obductum, et vulgo stratum corticale et stratum chondroideum (stratum medullare interius) continens. Apothecia lecideina gonidiisque destituta.

1. **Cladonia**. Hypothecium decoloratum pallidumve, ex hyphis irregulariter contextis formatum. 14.

2. **Pilophoron**. Hypothecium superne fuscescens et ex hyphis erectis formatum. 125.

1. **Cladonia** (Hill) Web.

Hill Hist. Plant. (1751) p. 91 p. maj. p.; Web. in Wiggers Prim. Fl. Hols. (1780) p. 90; Hoffm. Deutschl. Fl. II (1796) p. 152; Schaer. Lich. Helv. Spic. (1823) p. 18, (1833) p. 228, Enum. Lich. Eur. (1850) p. 183; Floerk. Clad. Comm. (1828) p. 5; Fr. Lich. Eur. Ref. (1831) p. 205; Koerb. Syst. Germ. (1855) p. 15; Nyl. Syn. Lich. (1858—1860) p. 187, Lich. Scand. (1861) p. 49; Th. Fr. Lich. Scand. (1871) p. 57; Vain. Clad. Phylog. (1880) p. 3, Mon. Clad. I (1887) p. 5, Etud. Lich. Brés. I (1890) p. 246; Krabbe Entw. Clad. (1891) p. 1. *Capitularia* Floerk. Beurth. Becherfl. (Berl. Magaz. 1 Jahrg. 1807) p. 294. *Cenomyce* Ach. Lich. Univ. (1810) p. 105, 526 p. max. p.; Del. in Dub. Bot. Gall. (1830) p. 619 p. max. p.

Apothecia apicibus (aut fortuito etiam lateri) podetiorum affixa aut raro (in var.) sessilia, lecideina (biatorina). Perithecium ex hyphis formatum pachydermaticis, cavitate angusta instructis, conglutinatis, in parte exteriori radiatim dispositis. Paraphyses simplices. Asci clavati. Sporae 8-nae, distichae, decolores, fusiformes aut oblongae ovoideaeve, simplices aut raro 1—3-septatae. Conidangia apicibus podetiorum aut margini scyphorum aut lateribus podetiorum axillarumve aut superficiei thalli primarii squamarumve affixa, sessilia aut breviter stipitata. Sterigmata septis paucis articulata aut exarticulata. Conidia cylindrico-filiformia aut fusiformi-cylindrica, tenuia, curvata aut rectiuscula. Gonidia

(sec. Warén Reinkult. Flechteng. p. 59) ad *Cystococcum glomeratum* Warén et (sec. Chodat in Mat. Fl. Crypt. Suisse IV p. 204) ad *C. irregularem* Chod. et *C. cladoniae* Chod. pertinentia.

Subg. 1. **Cladina**. Thallus primarius parce evolutus, crustaceus, mox evanescens. Podetia strato corticali destituta, basi emorientia et postea apice adhuc diu accrescentia. 20.

Subg. 2. **Pycnothelia**. Thallus primarius crustaceus, diu persistens. Podetia apice haud diu accrescentia. 26.

Subg. 3. **Cenomyce**. Thallus primarius squamaeformis aut foliaceus. 28.

Subg. 1. **Cladina** (Nyl.) Vain.

a. *Podetia albida* aut *cinerascentia* (aut *apice obscurata*), *KHO lutescentia*.

1. *Cl. rangiferina* (L.) Web. 21.

b. *Podetia vulgo straminea* (raro *subalbida*, aut *apice obscurata*), *KHO non reagentia*.

2. *Cl. sylvatica* (L.) Rabenh. Podetia vulgo laxae ramosae, apicibus sterilibus vulgo nutantibus. Conidangia nucleo albido. 22.

3. *Cl. alpestris* (L.) Rabenh. Podetia thyrsos densissimos formantia, apicibus rectis. Conidangia nucleo dilute coccineo. 25.

Subg. 2. **Pycnothelia** Ach.

4. *Cl. papillaria* (Ehrh.) Hoffm. 27.

Subg. 3. **Cenomyce** (Ach.) Th. Fr.

Ser. A. **Cocciferae**. Apothecia coccinea (aut raro pallida in formis regressis). 28.

a. **Subglaucescens**. Squamae thalli superne glaucescentes, subtus albae. 28.

I. Podetia typice ascypha (raro formis scyphiferis).

† Podetia KHO non reagentia (aut raro intus violascentia).

5. *Cl. Floerkeana* (Fr.) Sommerf. Podetia saltem partim corticata, esorediosa aut sorediis parcis instructa. 29.

6. **Cl. bacillaris* Nyl. Podetia dense farinoso-sorediosa. 31.

†† Podetia KHO lutescentia.

7. **Cl. macilentia* (Hoffm.) Nyl. 32.

II. Podetia typice scyphifera (formis ascyphis).

8. *Cl. digitata* Schaer. Podetia KHO lutescentia. 33.

b. **Stramineo-flavidae**. Squamae thalli superne substramineae. Podetia vulgo substraminea. 34.

✕ Podetia solediosa.

11. **Cl. deformis** Hoffm. Podetia crebre lateque farinoso-solediosa. 38.

10. ***Cl. pleurota** (Floerk.) Vain. Podetia parte superiore brevi grosse increbreque granuloso-solediosa. 37.

✕✕ Podetia esorediata.

9. **Cl. coccifera** (L.) Zopf. Podetia tabulatis brevioribus, tota corticata aut parte superiore disperse verrucosa, numquam apicibus subulatis. 35.

12. **Cl. bellidiflora** (Ach.) Schaer. Podetia esorediata, p. p. subulata, typice elongata, vulgo squamosa. 39.

Ser. B. **Ochrophaeae**. Apothecia fusciscentia aut pallida.

- a. **Unciales**. Thallus primarius parce evolutus, mox evanescentis (aut raro persistens). Podetia vulgo basi morientia et apice simul diu accrescentia, flavida (aut raro atypice albida). Apothecia parva (aut rarius majora), peltata et basi constricta, pallida. 42.

† Conidangia nucleo albido.

13. **Cl. amaurocraea** (Floerk.) Schaer. Podetia typice scyphifera aut saepe etiam ascypha, acidum dstrictinicum haud continentia. 42.

Cl. Zopfii Vain. Podetia typice ascypha aut raro obsolete scyphifera, acidum dstrictinicum continentia. 44.

†† Conidangia nucleo coccineo.

14. **Cl. uncialis** (L.) Web. Podetia ascypha. 46.

- β. **Chasmariae**. Thallus primarius bene evolutus, persistens aut demum evanescentis. Podetia albida aut glaucescentia aut fusciscentia (aut raro flavescientia), axillis vulgo perviis. Apothecia parva (raro majora), peltata basique constricta, fusciscentia aut raro pallida. 47.

- a. **Microphyllae**. Thallus primarius squamis parvis aut raro elongatis, angustis aut anguste partitis vel anguste crenatis. 48.

- I. Podetia esorediata aut grosse parcissime granuloso-solediosa.

§ Podetia bene evoluta, elongata aut brevia.

△ Podetia ascypha, sterilia nec apicibus nec axillis dilatato-hiantibus.

✕ Podetia elongata. Thallus haud solediosus.

15. **Cl. furcata** (Huds.) Schrad. Podetia KHO vulgo haud bene lutescentia. Conidangia basi bene constricta. 48.

16. **Cl. rangiformis** Hoffm. Podetia KHO lutescentia. Conidangia basi haud constricta. 54.

✕✕ Podetia brevia. Thallus solediosus.

20. *Cl. delicata* (Ehrh.) Floerk. Thallus et podetia KHO bene lutescentia. 69.

△△ Podetia scyphifera aut axillis et vulgo etiam apicibus dilatato-hiantibus, KHO non reagentia.

† Podetia esorediata, cortice continuo aut contiguae areolato, saepius squamis destituta.

17. *Cl. crispata* (Ach.) Flot. Podetia vulgo scyphifera, prolifera aut radiato-ramosa, basi haud maculata. 56.

18. *Cl. Delessertii* (Nyl.) Vain. Podetia ascypha, sympodialiter ramosa, axillis dilatato-hiantibus, basi vulgo maculata. 61.

†† Podetia granulosa aut esorediata, tota decorticata aut cortice verruculoso areolatove, partim disperso instructa, vulgo squamulosa.

19. *Cl. squamosa* (Scop.) Hoffm. 63.

§ Podetia brevissima, stipitiformia.

Cl. caespiticia (Pers.) Floerk. 70.

II. Podetia crebre subtiliter farinoso-soresdiosa.

21. *Cl. cenotea* (Ach.) Schaer. Podetia bene aut raro obsolete scyphifera, apicibus vulgo perviis, saepe scyphiferis.

22. **Cl. glauca* Floerk. Podetia ascypha aut raro scyphifera, apicibus sterilibus vulgo subulatis. 73.

b. *Megaphyllae*. Thallus primarius squamis elongatis latisque, margine integro aut late lobato.

23. *Cl. turgida* (Ehrh.) Hoffm. Podetia elongata, corticata. 75.

γ. *Clausae*. Thallus primarius bene evolutus, persistens aut demum evanescens, squamis latius partitis aut latius crenatis, vulgo crassiusculis. Podetia ascypha aut scyphis diaphragmate clausis instructa, axillis clausis. Apothecia majora mediocriave aut rarius parva, usque ad marginem suffulta aut rarius infra marginem constricta peltataque. Conidangia nucleo albido. 76.

a. *Podostelides*. Thallus primarius squamis minoribus majoribusve, subtus albis. Podetia ascypha, semper aut vulgo apotheciis terminata, parietibus incrassatis et vulgo laceratis, cavitate angustiore (aut raro solida). 77.

1. *Helopodium*. Podetia brevissima aut sat brevissima, apotheciis semper terminata (aut in nonnullis speciebus exoticis etiam sterilia. Apothecia fusca pallidiorave, saepe infra marginem constricta subpeltataque. Conidangia vulgo thallo primario affixa. 77.

† Podetia KHO lutescentia.

24. *Cl. cariosa* (Ach.) Spreng. Squamae thalli superne KHO lutescentes. 77.

25. **Cl. Hungarica* (Arn.) Vain. Squamae thalli KHO superne lutescentes, ad apices demum aurantiaco-rubescens. 79.

†† Podetia KHO demum rubescentia.

Cl. subcariosa Nyl. Squamae thalli KHO rubescentes. 81.

2. **Macropus.** Podetia longitudine vulgo medio-crista, partim etiam sterilia. Apothecia typice fusca, typice usque ad marginem suffulta. Conidangia apicibus lateribusve podetiorum affixa. 82.

§ Thallus primarius squamis crassis, vulgo latis aut late lobatis, strato corticali crasso. Podetia esorediata.

26. *Cl. alpicola* (Flot.) Vain. Podetia KHO non reagentia. 82.

§§ Thallus primarius squamis tenuioribus, sat anguste laciniatis, strato corticali tenuiore. Podetia vulgo sorediis granulaeformibus instructa.

△ Podetia KHO non reagentia, parce granulosa.

27. *Cl. decorticata* (Floerk.) Spreng. Podetia superne squamulosa, inferne squamosa. 85.

△△ Podetia KHO reagentia.

28. *Cl. Norrlini* Vain. KHO podetia lutescentia, thallus dilute lutescens. 86.

29. **Cl. acuminata* (Ach.) Vain. Thallus et podetia KHO lutescentia deindeque partim rubescentia. 87.

b. **Thallostelides.** Thallus primarius squamis minoribus majoribusve, subtus albis. Podetia vulgo scyphifera aut in eadem specie etiam ascypha, saepissime sterilia, cavitate podetiorum lata et parietibus tenuioribus. Apothecia fusca aut atypice pallida. 88.

× Podetia typice non e centro scyphorum prolifera.

§ Podetia nec tomentosa nec basi demum albido-maculata.

× Podetia elongata et tota aut maiore parte corticata.

† Podetia esorediata (aut raro parce granuloso-variegata).

30. *Cl. gracilis* (L.) Willd. Podetia acidum atranoricum haud continentia et KHO haud aut minus distincte lutescentia, sat crassa et tunc tabulato infimo haud valde elongata, aut sat gracilia. 89.

31. *Cl. elongata (Jacq.) Hoffm. Podetia acidum atranoricum continentia et KHO lutescentia, sat crassa, tabulato infimo valde elongato. 92.

†† Podetia apicem versus sorediata.

32. Cl. cornuta (L.) Schaer. Podetia maxima parte corticata. 94.

✕✕ Podetia brevia et corticata aut breviora longiorave et soredioso-decorticata.

+ Podetia scyphifera, scyphis vulgo latis et e parte inferiore podetiorum sensim dilatatis, brevia aut tabulatis brevibus, basin versus corticata.

37. Cl. pyxidata (L.) Fr. Podetia esorediata. 103.

38. *Cl. chlorophaea (Floerk.) Spreng. Podetia parte superiore sorediosa. 105.

+ + Podetia ascypha aut scyphis mediocribus angustisve, e parte superiore podetiorum vulgo sat abrupte dilatatis.

○ Podetia tota decorticata et subtiliter farinoso-sorediosa aut rarius parte inferiore corticata, parietibus modice incrassatis. Thallus primarius squamis crassioribus.

39. Cl. fimbriata (L.) Fr. Podetia elongata aut brevia, ascypha, scyphis mediocribus angustisve. Stratum chondroideum vulgo indistincte limitatum. 106.

○○ Podetia corticata aut fere tota decorticata, esorediata aut partim increbre grosseque granuloso-sorediosa, parietibus tenuibus. Thallus primarius squamis tenuioribus.

40. Cl. pityrea (Floerk.) Fr. Podetia vulgo brevia, ascypha aut scyphis angustis. Stratum chondroideum distincte limitatum.

§§ Podetia esorediata, inter areolas corticis sub- tomentosa, basi demum maculata.

33. Cl. degenerans (Floerk.) Spreng. Podetia KHO parum reagentia, scyphifera aut ascypha. 95.

34. Cl. cerasphora Vain. Podetia KHO lutescentia, ascypha. 99.

✕✕ Podetia e centro scyphorum prolifera.

△ Podetia proliferationibus demum elongata, apicibus sterilibus proboscideis aut p. p. ascyphis cornutisque.

35. Cl. gracilescens (Floerk.) Vain. Podetia KHO lutescentia, vulgo squamosa, basi partim maculata. 98.

△△ Podetia breviora, scyphis aut apotheciis terminata.

36. *Cl. verticillata* Hoffm. Podetia haud reagentia. 100.

**Cl. Krempelhuberi* Vain. Podetia KHO dilute lutescentia. 102.

- c. *Foliosae*. Thallus primarius squamis majoribus aut maximis, elongatis, saepe partim subtus sulfureis. Podetia scyphifera aut ascypha, straminea aut glaucescentia obscuratave. Apothecia saepe marginata, pallescentia aut fuscescentia.

† Thallus strepsilinum haud continens (KHO cum CaCl_2O_2 lutescens).

41. *Cl. foliacea* (Huds.) Schaer. Thallus inferne lutescens aut albidus, superne KHO non reagens. 115.

Cl. firma Nyl. Thallus inferne albidus aut rufescens, superne KHO lutescens. 117.

†† Thallus strepsilinum continens (KHO cum CaCl_2O_2 aeruginosum).

42. *Cl. strepsilis* (Ach.) Vain. Podetia ascypha. 117.

- d. *Ochroleucae*. Thallus primarius squamis minoribus. Podetia scyphifera aut ascypha, typice flavescientia stramineave. Apothecia pallescentia. 119.

§ Podetia corticata, esorediata.

43. *Cl. botrytes* (Hag.) Willd. Podetia ascypha aut raro subscyphifera, apotheciis semper terminata.

§§ Podetia soresdiosa, plus minus decorticata.

○ Podetia scyphifera, apicibus sterilibus haud subulatis.

44. *Cl. carneola* Fr. Scyphi regulares. 120.

○○ Podetia typice ascypha, apicibus sterilibus subulatis.

45. **Cl. bacilliformis* (Nyl.) Vain. Podetia brevia, long. 3—15 mm 121.

46. **Cl. cyanipes* (Sommerf.) Vain. Podetia elongata aut rarius mediocria, long. circ. 80—30 mm. 123.

Subg. 1. *Cladina* (Nyl.) Vain.

De Subg. Cladin. (Medd. S. F. Fl. Fenn. XIV, 1886) p. 31, Mon. Clad. I (1887) p. 8, III (1897) p. 222. *Cladina* Nyl. Fl. 1866 p. 179 p. p.; Müll. Arg. Fl. 1883 p. 17.

Hypothallus effusus. Thallus primarius crustaceus, e verruculis constans strato corticali destitutus, mox evanescens. Podetia elongata, subcylindrica, ascypha, ramosissima, vulgo arachnoideo-tomentosa, basi morientia et apice adhuc postea diu accrescentia, strato corticali destituta, strato chondroideo bene evoluto, strato medullari exteriori verruculas aut maculas sparsas, gonidia continentes, formante. Apothecia parva, in corymbo disposita, peltata, fusca aut pallida. Sporae simplices.

1. *Cl. rangiferina* (L.) Rabenh.

Clad. Eur. (1860) p. 11; Arn. Lich. Fränk. Jur. (Fl. 1884) p. 75; Vain. Mon. Clad. I (Act. S. F. Fl. Fenn. IV, 1887) p. 9, III (l. c. XIV, 1897) p. 222; Aigret Mon. Clad. Belg. (1903) p. 66. *Lichen rangiferinus* L. Spec. Plant. (1753) p. 1153 n. 65 p. p. (Vain. Rev. Lich. Linn. p. 8).

Exs. Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 80, cont. (1921) n. 596. — Havaas Lich. Exs. Norv. (1902) n. 92. — Malme Lich. Suec. Exs. XI (1912) n. 251, XXVIII (1917) n. 678, XXX (1918) n. 726. — Zahlbr. Krypt. Exs. Vindob. XXX (1916) n. 2354.

Podetia increbre fasciculato-ramosa, apicibus sterilibus vulgo nutantibus, cinerascentia aut subalbida, apicibus obscuratis fuscescentibusve, KHO lutescentia. Conidangia nucleo decolore.

Distr. Campos steriles siccus arenosos, rupes, ericeta, pineta et alias silvas siccas, paludes turfosos et tundras habitat. Supra et inter muscos et alios lichenes, nec non ad terram et rupes et raro ad lignum vetustum crescit. Frequenter et frequentissime et abundanter tota Fennia provenit.

Thallus primarius raro evolutus, crustaceus, tenuis, e verrucis constans circ. 0.224—0.4 mm latis, albidis, strato corticali destitutis. Podetia long. circ. 30 mm — 2 decim. magisve, crass. circ. 0.7—1.5 (—3) mm, subcylindrica, ascypha, ramosissima, parce subdichotome ramosa, abundantius subradiato- vel fasciculato-ramosa. Apothecia lat. 0.5—1.2 mm. Sporae oblongo-fusiformes, long. 0.008—0.013 (—0.015), crass. 0.002—0.003 (—0.0035) mm. Conidangia in apicibus podetiorum aggregata, lat. 0.170—0.110 mm. Conidia cylindrica, leviter aut bene curvata, long. 0.004—0.007, crass. vix 0.001 mm. Podetia acidum atranoricum et fumarprotocetraricum continentia (sec. Zopf Flechtenstoffe, 1907, p. 405). Gonidia sec. Warén (Reinkult. Flechtengon. in Öfvers. Finsk. Vet.-Soc. Förh. LXI, 1920, p. 59) ad *Cystococcum* (subg. *Eleuterococcum*) glomeratum Warén pertinentia, qui his verbis describitur: „Die Zellen meistens mehr oder weniger ellipsoidisch oder oval. Die Mutterzellen der Autosporen lange an einander haftend, wodurch oft grosse Kugeln von zahlreichen Zellen gebildet werden.“ „Bei der Autosporenbildung werden die Tochterzellen innerhalb der Mutterzellenmembran bald abgerundet. Die Anzahl der Autosporen in einem Sporangium ist sehr wechselnd, oft beträgt sie weit über 32 (bis 40—250).“ „Schwärmsporen werden in einem Sporangium in der Anzahl von ca. 100 oder

mehr gebildet. Sie sind ca. 7μ lang, 3.2μ breit und $1.6-2.4\mu$ dick; die Cilien sind 7μ lang.“

2. *Cl. sylvatica* (L.) Rabenh.

Clad. Eur. (1860) p. 11; Arn. Lich. Fränk. Jur. (Fl. 1884) p. 75; Vain. Mon. Clad. I (1887) p. 21, III (1897) p. 222; Aigr. Mon. Cl. Belg. (1903) p. 69 (Bull. Soc. Bot. Belg. XL, 1901); Sandst. Cl. Nordwestdeutsch. Tiefl. (Abh. Nat. Ver. Brem. XVIII, 1906) p. 392, II (l. c. XXI, 1912) p. 341. *Lichen rangiferinus* β . *sylvaticus* L. Spec. Plant. (1753) p. 1153 p. p. (Vain. Rev. Lich. Linn. p. 8).

Exs. Fr. Lich. Suec. VIII (1826) n. 239. — Stenh. Lich. Suec. Exs. n. 208. — Malme Lich. Suec. Exs. XII (1912) n. 276, XXX (1918) n. 727. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 597—623.

Podetia increbre ramosa, apicibus sterilibus vulgo nuntantibus, straminea aut raro glaucescenti-albida, KHO haud lutescentia. Conidangia nucleo albido.

Distr. Locis similibus, ac species praecedens, crescit et adhuc abundantius frequentiusque, quam ea, tota Fennia provenit.

Thallus primarius raro evolutus, crustaceus, tenuis, e verrucis constans $0.120-0.480$ mm latis, stramineo-flavescentibus, strato corticali destitutis. Podetia long. circ. $4-20$ centim., crass. $0.5-2.5$, raro 7 mm, subcylindrica, ascypha, ramosissima, parcius dichotome et sympodialiter ramosa, abundantius radiato-ramosa, radiis vulgo $4-3$, rarius 5 vel pluribus, summis apicibus vulgo paulum fusciscenti-obscuratis. Apothecia lat. $0.5-1.2$ mm. Sporae fusiformi-oblongae aut oblongo-ellipsoideae, long. $0.007-0.013$, crass. $0.002-0.0035$ mm. Conidangia in apicibus podetiorum aggregata aut solitaria, lat. $0.150-0.090$ mm. Conidia subcylindrica, medio paullo crassiora, vulgo leviter aut bene curvata, long. $0.005-0.008$, crass. 0.001 mm. Podetia KHO cum CaCl_2O_2 lutescentia vulgo continent acid. fumar-protocetraricum (mat. amaram) et dextro-usninium aut laevo-usninium et alias materias haud exacte cognitatas, quorum primum in formis albidis deest (sec. Zopf Flechtenst. p. 405, 431). Etiam saccharum in hac specie observatum est (sec. Zopf in Sandst. l. c. II p. 346).

Var. *sylvestris* Oed.

Vain. l. c. I p. 20, III p. 222. *Lichen rangiferinus sylvestris* Oed. in Fl. Dan. III fasc. 9 (1770) p. 4, tab. 532.

Est forma typica. Podetia elongata, straminea, arachnoideotomentosa. Distributio supra indicata. — Acid. dextro-usnicicum et amarum acid. fumar-protocetraricum continet (sec. Zopf l. c. p. 405, 431).

F. pumila (Ach.) Rabenh. Clad. Eur. (1860) tab. 39 n. 9; Vain. l. c. I p. 25, III p. 222. *Cenomyce rangiferina* ζ . *C. pumila* Ach. Lich. Univ. (1810) p. 25. Podetia brevica, crebrius ramosa. Haud rara.

F. dilatescens Vain. Podetia axillis dilatatis, radiatis. Videas p. 24.

F. laxiuscula Del., Vain. l. c. III p. 222 (*Cenomyce silvatica* γ . *laxiuscula* Del. in Dub. Bot. Gall., 1830, p. 621, Vain. l. c. I p. 29). Exs. Malme Lich. Suec. Exs. XXX (1918) n. 727. Norrl. et Nyl. Herb. Lich. Fenn. cont. n. 623 (622). Podetia glaucescenti-albida, impellucida, KHO non reagentia, addito CaCl_2O_2 lutescentia (reactione lutea interdum mox evanescente). Frequenter in Fennia, praesertim supra muscos in lapidibus saxisque silvarum crescens. — Sec. Zopf l. c. p. 405 continet acid. laevo-usnicicum, sed non amarum acid. fumar-protocetraricum, quare ut species autonoma „*Cl. laxiuscula* Sandst.“ in Zopf Flechtenst. (1907) p. 405 et Sandst. Clad. Nordw. Tiefl. II (1912) p. 343, tab. II f. 1 (*Cl. impexa* Harm. Lich. Fr., 1907, p. 232, tab. IX f. 16, tab. X f. 11) distinguitur. Limites inter formas stramineas et glaucescentes autem valde vagae sunt, quod indicat quantitates acidorum earum variare. Ceterum color flavidus lichenum in herbariis saepe demum in glaucescentem albidumve transmutatur, ita ut specimina numerosissima *Cl. sylvaticae* in mus. Fenn. jam glaucescentia sunt et *Parmelia centrifuga* (L.) in Th. Fr. Lich. Scand. Exs. I (1859) n. 6 ibi nunc thallo albo instructa est (sed KHO cum CaCl_2O_2 lutescens), nec facie externa differt a *P. aleuritica* Nyl. Si etiam chemice transmutentur, restat extricare.

F. erinacea Desmaz., Vain. l. c. I p. 33, III p. 223 (*Cenomyce silvatica* var. *erinacea* Desmaz. Cr. Fr. ed. 1, 1833, n. 6939, *Cl. laxiuscula* **Cl. portentosa* f. *erinacea* Sandst. l. c. II p. 346). Podetia incrassata, semipellucida, glaucescenti-albida, ramulis brevissimis irregulariter dispositis crebre instructa. Sec. Zopf in Sandst. l. c. continet acid. laevo-usnicicum et ericinum et 1% sacchari, sed haud materiam amaram. Est deflexus morbosus. Specimen prope Aboam lectum (P. A. Karsten), podetiis impellucidis tenuioribusque a typo differens, pertinet ad huic proximam f. *spumosa* Floerk.

Obs. 1. Formas numerosissimas inconstantes inextricabilesque producit. J. P. Norrlin tales assidue investigans, pro Herb. Lich. Fenn. suum sequentes collegit:

F. podetiis stramineis bene ramosis, crebre implexis, ramis divaricatis, foraminibus parvis. Norrl. et Nyl. Herb. Lich. Fenn. cont. n. 600.

F. podetiis stramineis, ramis thyrsoides, increbrioribus, brevioribus, haud unilateralibus. L. c. n. 601.

F. subcedriformis, straminea, ramis apicalibus fuscescentibus, modice unilateralibus. L. c. n. 602.

F. vulgaris, straminea, grossa, ramis brevioribus. L. c. n. 603.

F. vulgaris, straminea, ramis apicalibus brevioribus, minus unilateralibus. L. c. n. 604.

F. hians, subintegra, straminea. L. c. n. 605.

F. hians, spinulosa, straminea. L. c. n. 606.

F. hians, straminea. L. c. n. 607.

F. hians, integra, straminea. L. c. n. 608.

F. gracilior, straminea. L. c. n. 609.

F. cedriformis, straminea, ramis crebris, sat erectis, tenuibus. L. c. n. 610.

F. straminea, ramis apicalibus, tenuibus, unilateralibus, modice abbreviatis. L. c. n. 611.

F. vulgaris, straminea, ramis haud unilateralibus. L. c. n. 612.

F. straminea, ramis rectis, tenuibus. L. c. n. 613.

F. thyrsoides, straminea, apice cedriformi. L. c. n. 614.

Status *tenuior* Floerk., *gracilior*, stramineus, vetustus. L. c. n. 615.

F. straminea, axillis dilatatis, 4—7-radiatis. L. c. n. 616. In rupe prope Aquaeductum Helsingforsiae. Nominetur f. *dilatescens* Vain.

F. vulgaris, subnuda, straminea. L. c. n. 617.

F. straminea, apicibus crebris. L. c. n. 618.

F. straminea, ramis brevioribus. L. c. n. 619.

F. straminea, ramis increbris, axillis acutis. L. c. n. 620.

Obs. 2. *Cl. tenuis* Harm., Lich. Fr. (1907) p. 228 (*Cl. rangiferina* γ. *tenuis* Floerk. Clad. Comm., 1828, p. 164, Vain. l. c. I p. 27, *Cl. sylvatica* **Cl. tenuis* Sandst. Clad. Nordw. Tiefl. II, 1912, p. 342, tab. I f. 5, Zwackh Lich. Exs., 1884, n. 890, 1888, n. 1039), sec. herb. Floerk. est lusus *Cl. sylvaticae* podetiis 50—70 mm longis, tenuioribus, 0.7 (0.5) mm crassis, glaucescenti-albidostramineis vel subcinereis, maculis gonidiferis magis evolutis, passim subcontinuis, ramis tenuioribus et saepe radiatis, terminalibus nutantibus.

Cl. impexa Harm., l. c. p. 232 (*Cl. impexa* Malme Lich. Suec. Exs. XXX, 1918, n. 727), podetiis albidis, albido-stramineis, cinerascens aut glauco-virescentibus, ramis apicalibus haud unilateralibus, ad f. *laxiusculam* Del. et f. *portentosam* (Duf.) Del. spectat. — In Zahlbr. Krypt. Exs. XXIII (1915) n. 2272 ad *Cl. pycnocladam* f. *exalbescentem* pertinet.

Cl. condensata Zopf Zur Kenntn. Flechtenst. XVI (Ann. Chem. 352, 1907) p. 34, Flechtenst. (1907) p. 405 (*Cenomyce silvatica* var. *con-*

densata Floerk. Clad. Comm., 1828, p. 169, Vain. l. c. I p. 26, Arn. Lich. Exs., 1885, n. 1090, *Cl. sylvatica* f. *condensata* Coem. Clad. Belg. Exs. II, 1866, n. 156, *Cl. laxiuscula* **Cl. condensata* Sandst. l. c. II, 1912, p. 344, tab. II f. 2 a, b), sec. specim. in herb. Floerk. podetiis 0.7—0.5 mm crassis, glaucescenti-stramineo albidis, apicem versus bene ramosis, ramis tenuibus, terminalibus rectiusculis, haud nutantibus. Sec. Zopf l. c. in podetiis continet acid. laevo-usninicum et alium acidum, haud exactius cognitum, sed nullam materiam amaram. Lusus igitur est nostrae f. *laxiusculae*.

Cl. laxiuscula **Cl. spumosa* (Floerk.) Sandst., l. c. II, 1912, p. 344, tab. II f. 3 (*Cl. rangiferina* d. *alpestris* b. *spumosa* Floerk. Clad. Comm., 1828, p. 166, Vain. l. c. I p. 27, Arn. Lich. Exs., 1888, n. 1291, *Cl. alpestris* var. *spumosa* Zopf Zur Kenntn. Flechtenst. XV, Ann. Chem. 346 p. 108, Flechtenst., 1907, p. 405, 431), podetiis crassioribus, 2—2.5 mm crassis, maculis gonidiiferis magis evolutis et passim subcontinuis atque caesioglauescentibus vel subcinereis, apicem versus ramulis brevissimis, fere maculiformibus instructis. Sec. Zopf ll. cc. acid. laevo-usninicum et duas materias haud amaras, exactius haud cognitae, continet. Est status abnormis f. *laxiusculae*.

Cl. laxiuscula **Cl. portentosa* (Duf.) Sandst., l. c. II, 1912, p. 345, tab. III f. 1 (*Cenomyce portentosa* Duf. Rév. Clad., 1817, p. 29, *Cen. silvatica* ζ. *portentosa* Del. in Dub. Bot. Gall., 1830, p. 621, *Cl. sylvatica* f. *portentosa* Leight. Lich. Great. Brit. 3 ed., 1879, p. 67, Vain. Mon. Cl. I p. 32, III p. 223, Arn. Lich. Exs., 1888, n. 1345), podetiis circ. 7—2 mm crassis, difformibus, morbose incrassatis, rugosa lacunosaque, straminea, semipellucida, ramis solitariis dichotomisve aut radiatis, radiis 3—4, apicibus fere rectis aut parce paululum nutantibus.

Cl. mitis Sandst. Clad. Exs. I (1918) n. 55—69, 117—121, sec. Lynge Stud. Lich. Norw. (1921) p. 31 „the most wide-spread species of the *Cl. silvatica* section in Norway“. Ad specimina materiam amaram non continentia spectare videtur.

3. *Cl. alpestris* (L.) Rabenh.

Clad. Eur. (1860) p. 11; Vain. Mon. Clad. I (1887) p. 41, II (1894) p. 440, III (1897) p. 223. *Lichen rangiferinus alpestris* L. Spec. Plant. (1853) p. 1153.

Exs. Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 447, 448. — Havaas Lich. Exs. Norv. (1902) n. 83. — Malme Lich. Suec. Exs. X (1912) n. 227.

Podetia crebre radiato-ramosa, radiis vulgo 4—6 foramen axillarum cingentibus, ramis superioribus brevibus, thyrsos densissimos formantibus, apicibus rectiusculis, sub-

straminea, KHO non reagentia. Conidangia nucleo dilute coccineo (acidum rhodocladonicum continentia).

Distr. Locis similibus, ac species praecedentes, crescit, frequenter adhuc in provinciis meridionalibus Fenniae et frequentissime atque abundantissime in Lapponia proveniens.

Thallus primarius raro evolutus, crustaceus, tenuis, e verrucis constans 0.160—0.280 mm latis, stramineis, strato corticali destitutis. Podetia long. circ. 5—20 centim., crass. 0.5—2.5 mm, subcylindrica, ascypha, ramosissima, raro parvisimeque subdichotome ramosa, abundanter radiato-ramosa, tenuiter subarachnoideo-tomentosa. Apothecia lat. 0.3—0.5 mm. Sporae fusiformes oblongaeve, long. 0.010—0.014 (—0.006) mm, crass. 0.003—0.0035 (—0.002) mm. Conidangia in apicibus ramulorum solitaria aut parcius aggregata, lat. 0.140—0.090 mm. Conidia subcylindrica, leviter curvata aut parcius rectiuscula, long. 0.005—0.006 (0.004—0.008), crass. 0.0015 mm. Podetia KHO cum CaCl_2O_2 lutescentia, acid. laevo-usnicum et saccharum, at nullam mat. amaram continentia sec. Zopf Flechtenst. p. 405, 431.

F. *spumosa* Norrl. Vain. l. c. I p. 46, II p. 464, III p. 223 (*Cladina sylvatica* f. *spumosa* Nyl. in Norrl. et Nyl. Herb. Lich. Fenn. IX, 1882, p. 46), e parasitis paulum morbosa, podetiis tomento subarachnoideo abundantius evoluta, irregulariter radiatis aut partim dichotome ramosis.

Subg. 2. *Pycnothelia* Ach.

Vain. Mon. Clad. I (1887) p. 47, III (1897) p. 224. *Cenomyce* + *Pycnothelia* Ach. Lich. Univ. (1810) p. 571. *Pycnothelia* Duf. Rév. Clad. (1817) p. 5; Nyl. Fl. 1866 p. 179.

Hypothallus effusus. Thallus primarius crustaceus, e verrucis constans strato corticali destitutis, diu persistens. Podetia basi subpersistentia, apice haud diu accrescentia, breviter abortiva, ascypha, simplicia aut ramosa, glabra, strato corticali nullo distincto, strato chondroideo plus minus evoluta. Apothecia parva, aggregata, subpeltata. Sporae primum simplices, demum 1—3-septatae.

Cl. apoda Nyl. Fl. 1878 p. 241 (Vain. l. c. I p. 57) sec. herb. Nyl. est forma *Cl. papillariae*, analoga f. *pycnothelizae* *Cl. fimbriatae*, apotheciis sessilibus, thallo affixis et e latere podetii vetusti excrescentibus, passim etiam podetiis brevibus sterilibus instructa, disco ferrugineo-rufescente, KHO solutionem rufescentem effundente et crystalli aci-

cularia dilute subrufescentia formante, sporis simplicibus, verisimiliter haud maturis. — *Pycnothelia cladinoidea* Nyl. in Hue Lich. Exot. (1892) p. 324 ad **Cl. Carolinianam* (Schwein.) Tuck. (Vain. l. c. I p. 270) pertinet, ut specim. originalia ambarum in herb. Nyl. ostendunt.

4. *Cl. papillaria* (Ehrh.) Hoffm.

Deutschl. Fl. II (1796) p. 117; Floerk. Cl. Comm. (1828) p. 5; Nyl. Syn. Lich. (1860) p. 188, Lich. Scand. (1861) p. 49; Th. Fr. Lich. Arct. (1860) p. 160, Lich. Scand. (1871) p. 95; Vain. Mon. Clad. I (1887) p. 48, III (1897) p. 224. *Cenomyce* Ach., Lich. Univ. (1810) p. 571, Syn. Lich. (1814) p. 248; Del. in Dub. Bot. Gall. (1830) p. 620. *Pycnothelia* Duf. Rév. Clad. (1817) p. 5. *Papillaria ventricosa* Kickx in Westend. Herb. Crypt. Belg. (1841) n. 16; Coem. Obs. Lich. Westend. (1858) p. 5.

Exs. Fr. Lich. Suec. Exs. VIII (1826) n. 233. — Sommerf. Pl. Crypt. Norv. I (1826) n. 74. — Floerk. Clad. Exs. (1829) n. 1. — Nyl. Herb. Lich. Par. II (1855) n. 107. — Th. Fr. Lich. Scand. Exs. (1859) n. 16. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 54, 55, cont. (1921) n. 595. — Havaas Lich. Exs. Norv. (1902) n. 9. — Malme Lich. Suec. Exs. X (1892) n. 227.

Podetia plus minus evoluta. Apothecia stipitata.

Distr. Ad terram macram arenosam in ericetis et campis sterilibus et locis apricis siccis, raro supra muscos rupium. Passim aut sat rare in provinciis australibus Fenniae et adhuc in Ta. (Norrl. Bidr. Sydöstr. Tav. Fl. p. 175) et in Nilsjö in Sa. (sec. E. Nyl. Lafveg. Sav. in Not. Sällsk. F. Fl. Fenn. Förh. III p. 67). Ad Luvajärvi in KVien. occ. (Vain. Adj. Lich. Lapp. II p. 101) et in Selki in KOn. (Norrl. Fl. Kar. Oneg. II p. 12). — Ad Hammerfest in Finmarkia Norvegiae sec. Lynge (Stud. Lich. Norw. p. 33).

Thallus primarius bene evolutus et vulgo persistens, e verrucis constans 0.140—0.450 mm latis, contiguis aut confluentibus, plagas majores minoresve formans, proliferationibus vel ramulis verrucaeformibus saepe demum innovatus, quales formationes ab auctoribus nonnullis erronee ut primordia podetiorum, ad instar pseudopodetiorum nascentium, descriptae delineataeque sunt. Podetia long. usque ad 10—20, crass. 0.5—2.5 mm, simplicia aut ramis instructa irregularibus, brevibus aut papillaeformibus, axillis clausis, sorediis destituta, albida aut pallido-albida aut glaucescentia, KHO lutescentia. Apothecia lat. 0.3—0.7 mm, in apicibus podetiorum vulgo numerosissime aggregata, rufa aut rarius fusciscentia, KHO solutionem subrufescentem effundentia et crystalli-

acicularia dilute rufescentia formantia. Sporae fusiformes oblongaeve, long. 0.009—0.015, crass. 0.002—0.0035 mm, diu simplices, demum 1—3-septatae. Conidangia lat. 0.260—0.180 mm, solitaria aut aggregata, nucleo albido. Conidia subcylindrica, apicibus attenuatis (sec. Nyl.), leviter aut bene curvata aut parcius fere recta, long. 0.008—0.014, crass. 0.0005 mm. Podetia ac. atranoricum continent sec. Zopf in Sandst. l. c. II p. 347.

F. molariformis (Hoffm.) Schaer. Lich. Helv. Exs. (1847) n. 512; Vain. l. c. *Cl. molariformis* Hoffm. l. c. — Exs. Sommerf. l. c. n. 74, Th. Fr. l. c. n. 16, Havaas l. c. n. 96, Malme l. c. n. 227. Podetia bene evoluta, simplicia aut ramosa. Thallus primarius persistens aut demum evanescent. Minus frequens quam *f. papillosa*.

F. papillosa Fr. in Wallr. Naturg. Säulch.-Flecht. (1829) p. 172; Vain. l. c. Podetia brevia vel papillaeformia, simplicia, sterilia aut conidiifera. Thallus primarius persistens. Locis siccioribus crescit.

Subg. 3. *Cenomyce* (Ach.) Th. Fr.

Lich. Scand. (1871) p. 64; Vain. l. c. II p. 58, III p. 224. *Cladonia* Nyl. Fl. 1866, p. 178, Lich. Lapp. Or. (1866) p. 108.

Hypothallus fruticulosus, constans ex axi crassiusculo, brevi, inferne plus minus ramoso. Thallus primarius squamaeformis aut foliaceus, strato corticali cartilagineo, ex hyphis pachydermaticis, cavitatibus angustis instructis, subverticalibus aut irregulariter dispositis formato (raro evanescente) obductus. Sporae simplices.

Ser. A. *Cocciferae* Del.

Vain. l. c. I p. 59, III p. 224. *Cenomyce* XI. *Cocciferae* Del. in Dub. Bot. Gall. (1830) p. 632.

Apothecia coccinea, acid. rhodocladonicum continentia (sec. Zopf Flechtenst. p. 302, 321, Beitr. Chem. Mon. Cl. p. 53, 98) aut raro (in var.) pallida. Conidangia extus plus minus coccinea aut demum fuscescentia, sed sub microsc. rubricosa, in nucleo gelatinam coccineam aut (in var. ochrocarpis) albidam continentia.

a. *Subglaescentes* Vain.

Squamae thalli superne subglaescentes aut olivaceo-fuscescentes, subtus albae aut raro obscuratae. Podetia albida cinerascentiave aut albido-glaescentia vel olivaceo-

fuscescentia, raro straminea (acid. usnicum haud aut raro continentia, videas sub **Cl. bacillari*, p. 31), CaCl_2O_2 cum KHO alio modo non colorata, quam KHO solo.

5. *Cl. Floerkeana* (Fr.) Sommerf.

Suppl. Fl. Lapp. (1826) p. 128; Vain. l. c. I p. 72, III p. 225; Harm. Lich. Fr. (1907) p. 332.

Thallus primarius squamis sat parvis, sat tenuibus. Podetia subcylindrica, vulgo ascypha, obtusa, saltem partim corticata, sorediis destituta aut parce sorediosa, impellucida, KHO non reagentia, strato corticali tenui.

Distr. Ad terram humosam vel arenariam et muscos destructos rupium aut fissuris rupium affixa, praesertim locis apricis, sat frequenter in provinciis australibus Fenniae provenit, septentrionem versus rarescens.

Podetia strato corticali circ. 0.20—0.35 mm crasso. Apothecia mediocria, rarius parva, circ. 1—2 (0.5—2.5) millim. lata, solitaria aut rarius aggregata, convexa. Sporae oblongae aut fusiformi-oblongae, apicibus obtusis, long. 0.008—0.014, crass. 0.0025—0.003 mm. Conidia cylindrica aut subfusiformia, curvata, long. 0.006—0.009, crass. vix 0.001 mm.

Var. *chloroides* (Floerk.) Vain.

l. c. I p. 76, III p. 226. *Cenomyce chloroides* Floerk. in Sommerf. Phys. Oecon. Saltđ. (1826) p. 62, Suppl. Fl. Lapp. (1826) p. 128. *Cl. clonoides* Floerk. Clad. Comm. (1828) p. 100. *Cl. Floerkeana* f. *vulgaris* Th. Fr. Lich. Scand. (1871) p. 66.

Exs. Fr. Lich. Suec. Exs. III (1824) n. 82. — Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 445. — Havaas Lich. Exs. Norv. XII (1913) n. 428.

Podetia mediocria, ascypha, corticata, sorediis et squamis destituta, vulgo olivaceo-glauescentia aut colore variegata. Apothecia coccinea.

Distr. In regione Aboënsi et Nylandia passim — sat frequenter. IK.: Pällilä in Muola (A. O. Kairamo). Ka.: Vakavuori in Sippola (V. Kujala). Passim — sat rare in Tavastia austr.

Var. *intermedia* Hepp

Flecht. Eur. II (1857) n. 291 pr. p.; Vain. l. c. I p. 78, III p. 226; Zopf Beitr. Chem. Mon. Clad. (Ber. Deutsch. Bot. Gesellsch. Festschr. 1907, XXVI) p. 55, tab. IV f. 2; Sandst. l. c. II (1912) p. 347.

Exs. Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 627.

Podetia mediocria, ascypha, corticata et simul sorediosa, squamis destituta, colore variegata. Apothecia coccinea.

Distr. In regione Aboënsi et Nylandia passim praesertimque inter alias formas, parce. In Sutoisenniemi in Korpilahti in Tb. (Vain.). Ad Pankajärvi in par. Lieksa in Kb. (Vain.).

Podetia acid. coccellicum et *cenomycinum* continent sec. Zopf Flechtenst. p. 245, 406 et Beitr. Chem. Mon. Clad. p. 55.

Var. *carcata* (Ach.) Nyl.

Lich. Scand. (1861) p. 62; Vain. l. c. I p. 80, III p. 226. *Cl. trachypoda* Nyl. in Hue Addend. II (1887) p. 331 (Vain. l. c. I p. 83, II p. 441).

Exs. Th. Fr. Lich. Scand. Exs. I (1859) n. 74 pr. p. (in mus. Fenn. etiam v. *intermediam* et **Cl. bacillarem* continet). — Malme Lich. Suec. Exs. XXIV (1916) n. 579.

Podetia mediocria, modice squamulosa, colore variegata, ascypha.

Distr. Al.: Geta (E. Nylander). Ab. et N.: Passim — sat frequenter. St.: Kokemäki (A. J. Malmgren). Ta.: Koski, Hollola, Orimattila, Judinsalo in Luhanka (Vain.). Ob.: Kallinkangas in Kemi (V. Räsänen).

F. squamosissima Th. Fr.; Vain. l. c. III p. 226 (*Cl. Floerkeana* f. *squamosissima* Th. Fr. Lich. Scand., 1871, p. 66).

Podetia squamulis densissimis omnino vestita.

Distr. Ad Helsingforsiam et alibi in provinciis australibus praesertim inter var. *carcatam*. Ad Mujejärvi in par. Nurmes in Kb. (Vain.).

F. trachypoda Nyl. in Larbal. Lich. Exs. (1879) n. 84; Vain. l. c. I p. 83, III p. 226. *Cl. bacillaris* var. *trachypoda* Nyl. in Norrl. et Nyl. Herb. Lich. Fenn. (1882) n. 444.

Podetia praesertim parte superiore granuloso-squamulosa, albido-cinerascentia.

Distr. In provinciis australibus, praesertim inter var. *carcatam*.

Var. *scyphellifera* Vain.

Podetia mediocria, scyphifera, scyphis angustis, parte superiore sorediosa, ceterum corticata, squamis destituta.

Distr. Ad Kosagora in Karelia Vienaënsi (A. Kullhem).

In var. *intermediam* transit et distinguenda a var. *scyphulifera* Aigret (Mon. Clad. Belg., 1903, p. 208), quae non est sorediosa. — *Podetia* alt. 15—20 mm, inferne crass. 1.7—0.7 mm, albida, KHO non distincte reagentia, scyphis 4.5—2 mm latis, subtiliter sorediosis (etiam intus).

Var. **aurea** Vain.

**Cl. macilenta* η. *aurea* Vain. l. c. II p. 443, III p. 227.

Podetia intus materiam fulvam, KHO violascentem continentia.

Distr. Ad plantas destructas supra rupem ad Kaukola in Karjalohja (C. E. Boldt) in Ab.

Podetium materia fulva destitutum, KHO non reagens, in eodem caespite cum v. *aurea* crescens, indicat hunc deflexum a *Cl. Floerkeana* evolutum esse, nec a **Cl. macilenta*. Podetia long. 20—8, crass. 1.5—0.5 mm, ascypha, verruculosa et subsquamuloso-scabrida et sorediosa, basi corticata. Apothecia coccinea. Conidangia apicalia, vertice coccinea.

6. **Cl. bacillaris* Nyl.

Vain. l. c. I p. 88, II p. 441, III p. 226. *Cl. bacillaris* Nyl. Lich. Lapp. Or. (1866) p. 179 (haud Ach. Meth. Lich., 1803, p. 329); Zopf Flechtenst. (1907) p. 103, 406, Beitr. Chem. Mon. Clad. (1908) p. 98; Sandst. Clad. Nordw. Tiefl. II (1912) p. 349.

Thallus primarius squamis sat parvis. Podetia cylindrica, vulgo ascypha, maxima parte sat dense farinoso-sorediosa, KHO non reagentia.

Distr. Ad terram et muscos vel alias plantas destructas in rupibus et in campis apricis et ad truncos putridos locis siccis apricis vel subumbrosis crescit, sat frequenter in maxima parte Fenniae proveniens, septentrionem versus rarens, adhuc ad Suomula et Lehtovaara (65° l. s.) in par. Kianta (Vain.) in OKaj. et ad Simo (V. Räsänen) in Ob. Ad Koroppi (Vain.) in KVien. occ.

Var. **clavata** (Ach.) Vain.

l. c. I p. 92, III p. 226. *Baeomyces deformis* β. *B. clavatus* Ach. Meth. Lich. (1803) p. 334. *Cl. bacillaris* a. *clavata* Sandst. l. c.

Exs. Fr. Lich. Suec. Exs. II (1818) n. 52 p. p. — Th. Fr. Lich. Scand. Exs. I (1859) n. 74 p. p. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 75, IX (1882) n. 443.

Podetia mediocria aut breviuscula, simplicia, apice vulgo obtuso. Apothecia coccinea.

Distr. supra indicata.

Haec planta sec. Zopf Flechtenst. (1907) p. 406 (103) et Beitr. Chem. Mon. Clad. (1908) p. 63 continet acid. usnicum (in hoc Zopf forsitan errat), coccellicum et cenomycinum, quod indicare videtur **Cl. bacillarem* autonomam esse speciem, sed notis morfologicis evidenter in *Cl. Floerkeanam* var. *intermediam* transit (conf. Vain. l. c. I p. 93).

Etiam materiae in lichenibus formatae variare possunt, sicut materiae rubricosae aurantiacaeque, in thallo primario et podetiis *Cl. miniatae* et *Cl. Floerkeanae* (v. *aureae*) et in thallo *Physciae obscurae* valde inconstanter provenientes, bene demonstrant. Ceterum etiam apotheciorum color fuscescens et pallescens est valde inconstans. — Podetia long. circ. 10—20 (5—30), crass. circ. 1 (0.5—2) mm. Sporae oblongo-fusiformes oblongaeve, apicibus obtusis, long. 0.009—0.011, crass. 0.0025—0.003 mm. Conidia cylindrica, curvata, long. 0.006—0.008, crass. vix 0.001 mm.

7. **Cl. macilenta* (Hoffm.) Nyl.

Fl. 1873 p. 66, Obs. Pyr. Or. (1873) p. 29; Hoffm. Deutschl. Fl. (1796) p. 126, excl. syn. cit. (Vain. Rev. Lich. Hoffm., 1886, p. 17); Vain. l. c. I p. 98, II p. 442, III p. 227. *Cl. macilenta* Zopf Zur Kenntn. Flechtenst. (Liebig's Ann. Chem. 327, 1903) p. 339, tab. IV f. 1, Flechtenst. (1907) p. 103, 406, Beitr. Chem. Mon. Clad. (1908) p. 58, 109; Sandst. Clad. Nordw. Tiefl. II (1912) p. 350.

Thallus primarius squamis sat parvis. Podetia cylindrica, ascypha, dense farinoso-sorediosa aut raro verruculoso-corticata, KHO lutescentia.

Var. *styracella* (Ach.) Vain.

l. c. I p. 105, III p. 105. *Baeomyces bacillaris* γ. *B. styracellus* Ach. Meth. Lich. (1803) p. 330.

Exs. Fr. Lich. Suec. Exs. II (1818) n. 52 p. p. — Havaas Lich. Exs. Norv. (1905) n. 268. — Malme Lich. Suec. Exs. XXV (1916) n. 602.

Thallus primarius laciniatus crenatusve. Podetia long. mediocria, obtusa, decorticata, crebre sorediosa, squamis fere destituta, intus alba. Apothecia rubra.

Distr. Ad terram humosam, muscos destructos in rupibus, truncos putridos et cortices destructos arborum, praesertim locis apricis crescens, sat frequenter — passim in partibus meridionalibus Fenniae provenit, septentrionem versus rarescens, lecta adhuc ad Tervasalmi in par. Kuhmo in OKaj. (Vain.). Ad Koroppi in KVien. occ. (Vain.).

Thallus primarius squamis circ. 1—4 mm longis et 1—3 mm latis. Podetia long. circ. 15—20 (5—25) mm, crass. 1—1.5 (0.5—2) mm, ceno-mycinum, acid. coccellicum et thamnolicum continentia, quorum posterius KHO reactionem luteam praebet et chloroformo addito rubescit, sed in solutione alcoholica FeCl_2 violascit (sec. Zopf Beitr. Chem. Mon. Clad. p. 59). Gonidia ad Cystococcum (Eleuterococcum) glomeratum pertinentia (sec. Warén l. c. p. 59).

Var. *squamigera* Vain.

l. c. I p. 109, II p. 442, III p. 227. *Cl. macilenta* var. *carcata* Nyl. in Hue Addend. II (1887) p. 331.

Thallus primarius laciniatus crenatusve. Podetia long. medio-cria, apicibus obtusis, plus, minus sorediosa, squamosa. Apothecia rubra.

Distr. Ad truncum carbonatum prope Savijärvi in par. Lammi in Ta. (Vain.).

8. *Cl. digitata* Schaer.

Lich. Helv. Spic. I (1823) p. 22, III (1833) p. 281; Vain. l. c. I p. 123, II p. 443, III p. 227. *Lichen digitatus* L. Spec. Plant. (1753) p. 1152 n. 62 forsan p. p.

Thallus primarius squamis magnis aut mediocribus. Podetia vulgo scyphifera, scyphis mediocribus aut latis, vulgo sat abrupte dilatatis, vulgo parte superiore farinoso-sorediosa, granulis sorediorum minutis, KHO lutescentia.

Var. *monstrosa* (Ach.) Vain.

l. c. I p. 128, III p. 228. *Cenomyce digitata* c. *monstrosa* Ach. Syn. Lich. (1814) p. 268.

Exs. Fr. Lich. Suec. Exs. III (1824) n. 85. — Nyl. Herb. Lich. Par. I (1855) n. 25. — Havaas Lich. Exs. Norv. (1905) n. 244, 270. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 624, 625, 626.

Podetia scyphifera, scyphis sat dilatatis, parte superiore sorediosa, parte inferiore corticata. Apothecia rubra.

Distr. Ad truncos putridos et ligna cariota praesertim in silvis et rarius locis apricis crescens, sat frequenter in maxima parte Fenniae provenit, et in Lapponia rarior. In reg. subalpina montis Iivaara in Kuusamo et montis Pyhäntunturi in par. Kemijärvi, ceterum ad Sodankylä (Vain.) et fl. Venejoki in Kittilä (G. Lång) in LKem., ad Inarijärvi et Paatsjoki in LIn. (Vain.), ad Palojoiki in LENont. (J. P. Norrlin), ad Soukelo in KKER., ad Imandra in LIm. (N. I. Fellman), ad Kuollajoki (N. I. Fellman) et Kögäs prope Mare Glaciale (Vain.) in LTul.

Thallus primarius persistens aut demum evanescens, squamis circ. 3—15 mm longis. Podetia long. circ. 10—50 mm, parte inferiore circ. 1—2 (0.5—4) mm crassa, albida aut cinereo-glauescentia, scyphis circ. 3—8 (—10) mm latis et 2—4 mm altis, sat regularibus aut irregularibus, acidum thamnolicum circ. 2 % continentia sec. Zopf Flechtenst. p. 265, 406, Beitr. Chem. Mon. Clad. p. 61. Sporae oblongae aut ovoideo-oblongae, long. 0.010—0.014, crass. 0.003—0.004 mm. Conidia cylindrica aut apices versus levissime attenuata, recta aut parcius paulum curvata, long. 0.005—0.009, crass. vix 0.001 mm.

Obs. Modif. *phyllophora* Anzi (Vain. l. c. I p. 131, III p. 228), podetiis squamosis instructa, parce obveniēns, et modif. *brachytes* (Ach.) Vain. (l. c. I p. 132, III p. 228, *Baeomyces bacillaris* β . *B. brachytes* Ach. Meth. Lich., 1803, p. 329), scyphis angustis et podetiis haud squamosis dignota, passim proveniēns, valde inconstantes sunt.

Var. *glabrata* Del.

Vain. l. c. I p. 133, III p. 228. *Cenomyce digitata* ζ . *glabrata* Del. in Dub. Bot. Gall. (1830) p. 633.

Podetia scyphifera, tota corticata aut maculis sparsis sorediosis. Apothecia rubra.

Distr. Ad truncum putridum in silva in monte Tiirismaa in Hollola in Ta. (Vain.).

Thallus primarius demum evanescens aut persistens, squamis circ. 3—5 mm longis latisque. Podetia long. circ. 15—35 mm, basi 1—2 mm crassa, scyphis circ. 3—5 mm latis, irregularibus aut sat regularibus, margine proliferis, tabulatis 1—3, cortice continuo aut fissuris maculisve sparsis sorediosis instructa, squamis destituta.

Var. *ceruchoides* Vain.

l. c. I p. 133, III p. 228; Aigret Mon. Clad. Belg. (1903) p. 91.

Thallus primarius squamis vulgo magnis aut majusculis. Podetia saltem p. p. ascypha.

Distr. Ad lignum putridum in silva in monte Tiirismaa in Hollola in Ta. (Vain.).

Podetia long. circ. 10—20, crass. 1—2 mm, ascypha aut nonnulla scyphifera immixta scyphisque sat angustis, simplicia aut apicem versus parce ramosa.

Var. *albinea* Vain.

l. c. II p. 443, III p. 228.

Apothecia pallida.

Distr. Ad truncum putridum loco umbroso in monte Tiirismaa in Hollola in Ta. (Vain.).

Apothecia p. p. in iisdem podetiis etiam coccinea.

β . *Stramineo-flavidae* Vain.

Squamae thalli superne stramineae aut flavido-glaucescētes, subtus stramineo-albidae aut albidae. Podetia straminea aut flavescentia aut rarius glaucescentia albidave (acidum usnicum continentia), CaCl_2O_2 cum KHO lutescentia.

9. *Cl. coccifera* (L.) Zopf

Flechtenst. (1907) p. 405, Beitr. Chem. Mon. Clad. (1908) p. 65, 99; Willd. Fl. Berol. (1787) p. 361 (p. p.); Vain. l. c. I p. 149 (excl. v. pleurota et subv.), III p. 228 (excl. v.). *Lichen cocciferus* L. Spec. Plant. (1753) p. 1151 n. 57 p. maj. p. (conf. Vain. Rev. Lich. Linn., 1886, p. 7, et l. c. I p. 154).

Thallus primarius laciniis latioribus. Podetia scyphifera, tabulatis brevibus aut mediocribus, corticata, esorediata, KHO non reagentia (acidum laevo-usninicum et coccellicum et cenomycinum continentia), proliferationes scyphis aut apotheciis terminatae.

Var. *stematicina* Ach.

Vain. l. c. I p. 158, III p. 228. *Cenomyce coccifera* a. *C. stematicina* Ach. Lich. Univ. (1810) p. 597.

Exs. Fr. Lich. Suec. Exs. III (1824) n. 83. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 76.

Podetia squamis et sorediis destituta, simplicia aut margine scyphorum prolifera. Apothecia coccinea.

Distr. Ad terram humosam vel arenosam et ad muscos praesertimque destructos in rupibus et saxis crescit. Loca parum humida vel sicca, velut pineta et rupes subapricas, praeferens, frequenter toto territorio provenit.

Thallus primarius sorediis destitutus. Podetia long. circ. 50—5 mm, basi crass. circ. 4—0.7 mm, scyphifera, scypho sat abrupte aut sensim dilatato, regulari aut rarius demum obliquo, simplicia aut margine scyphorum prolifera, cortice praesertim basin versus subcontinuo aut saepius areolato aut in parte superiore verrucoso verruculoso, areolis verruculisque contiguis aut dispersis, acidum laevo-usninicum et coccellicum et cenomycinum continentia sec. Zopf Flechtenst. p. 432, Beitr. Chem. Mon. Clad. p. 66, 109. Sporae fusiformes aut suboblongae aut ovoideo-oblongae, long. 0.008—0.012 (—0.006), crass. 0.0025—0.0035 mm. Conidangia ovoidea aut ovoideo-ampullacea aut conoidea aut subcylindrica, lat. 0.350—0.220 mm, basi modice aut non constricta, vulgo fusca margineque coccineo aut primum tota coccinea. Conidia subcylindrica, apicibus paullo tenuioribus, curvata vel leviter curvata, long. 0.006—0.008, crass. circ. 0.001 mm. Gonidia ad Cystococcum glomeratum (sec. Warén Reink. Flechtengon. p. 59) pertinentia.

Obs. Modif. *extensa* Ach. (Mon. Clad. Univ. I p. 161, *Baeomyces cocciferus* β . *B. extensus* Ach. Meth. Lich., 1803, p. 332), podetiis turbinatis, scyphis sensim dilatatis instructa, haud est rara in territorio

nostro. — Modif. *coronata* Del. (*Cenomyce coccifera* d. *coronata* Del. in Dub. Bot. Gall., 1830, p. 632, Vain. l. c. I p. 162, *Cl. cornucopioides* f. *extensa* Vain. Lich. Vib., 1878, p. 45, Adj. Lich. Lapp. I, 1881, p. 101), apotheciis in margine scyphorum confluentibus, podetiis macris, brevibus, squamis et sorediis destitutis instructa, nonnullis locis est collecta.

Var. *phyllocoma* Floerk.

Clad. Comm. (1828) p. 94; Vain. l. c. I p. 155, III p. 229.

Exs. Malme Lich. Suec. Exs. XXVI (1917) n. 626. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 628, 629.

Scyphi dilatati. Podetia praesertim scyphis squamosis, simplicia aut margine scyphorum prolifera, sorediis destituta. Apothecia coccinea.

Distr. Praesertim locis subhumidis crescit, passim in terr. nostro proveniens et vulgo in v. *stemmatinam* transiens.

F. *alpina* (Hepp) Vain.

l. c. I p. 156, III p. 229. *Cl. bellidiflora* f. *alpina* Hepp Flecht. Eur. IV (1867) n. 785. *Cl. cornucopioides* v. *foliolifera* Nyl. in Henriques Contr. Fl. Crypt. Lusit. (1880) p. 37 (sec. specim. orig.). *Cl. cornucopioides* **extensa* f. *foliolifera* Nyl. in Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 442.

Podetia tota dense squamosa, scyphis p. p. angustis, simplicia aut margine scyphifera, sorediis destituta. Apothecia coccinea.

Distr. In lateribus et declivis rupium prope Helsingforsiam et in Enonsaari in Hollola in Ta. (Vain. et Norrl.).

Var. *asotea* Ach.

Vain. l. c. I p. 164, III p. 229. *Baeomyces cocciferus* γ. *B. asoteus* Ach. Meth. Lich. (1803) p. 332.

Podetia squamis et sorediis destituta, e centro scyphorum prolifera. Apothecia coccinea.

Distr. Pluribus locis collecta in Fennia (Vain. Fl. Tav. Or. p. 95, Adj. Lich. Lapp. I p. 101). In Isovaara in Kittilä in LKem. (G. Lång).

Podetia long. circ. 15—35, basi crass. 1—2 mm, turbinata, scyphis vulgo sensim dilatatis, tabulatis 2—4, saepe etiam margine scyphi prolifera.

Obs. Modif. *cornucopioides* (Gray) Vain. l. c. III p. 229, II p. 157 (*Scyphophora asotea* β. *cornucopioides* Gray Nat. Arrang. Brit. Pl., 1821, p. 423). Podetia squamosa, sorediis destituta, e centro scyphorum prolifera. Apothecia coccinea.

Ad Kenraalinkylä in Värtsilä et ad Kirkonkylä in Korpiselkä in Kb. (K. Linkola).

Var. **ochrocarpia** Floerk.

Clad. Comm. (1828) p. 95; Vain. l. c. I p. 166, III p. 229. *Cenomyce coccifera* v. *ochrocarpia* Floerk. in Sommerf. Suppl. Fl. Lapp. (1826) p. 128.

Podetia sorediis destituta. Apothecia pallida aut maculis aurantiaco-rubentibus.

Distr. Supra muscos destructos in saxis et rupibus. Mäkiinpäällys Hoglandiae (Vain.), Tvärminne (E. Häyrén) in N., Upila in Hollola (Vain.) in Ta.

Podetia simplicia aut prolifera, squamis destituta aut basi squamosa. Conidangia pallida aut obscurata, interdum acidum rhodocladonicum continentia.

10. ***Cl. pleurota** (Floerk.) Vain.

Cl. pleurota Schaer. Enum. Lich. Eur. (1850) p. 186 p. p.; Anzi Catal. Sondr. (1860) p. 14; Zopf Flechtenst. (1907) p. 108, 406, 432, Beitr. Chem. Mon. Clad. (1908) p. 63, 99; Sandst. Clad. Nordw. Tiefl. II (1912) p. 355. *Capitularia pleurota* Floerk. Besch. Rothfr. Becherfl. (1808) p. 218 p. p. *Cenomyce pleurota* Ach. Syn. Lich. (1814) p. 270. *Cl. coccifera* var. *pleurota* Schaer. Lich. Helv. Spic. (1823) p. 25 p. p.; Vain. l. c. I p. 168, III p. 229.

Exs. Fr. Lich. Suec. Exs. III (1824) n. 84. — Havaas Lich. Exs. Norv. (1902) n. 94. — Nyl. et Norrl. Herb. Lich. Fenn. (1921) cont. n. 630, 631.

Podetia plus minus soresiosa granulosave, vulgo mediocria, squamis destituta aut raro squamosa.

Distr. Sat frequenter in provinciis australibus, in Kuusamo et septentrionem versus rarior aut passim.

Podetia long. circ. 40—4 mm, basi crass. 4—0.7 mm, scyphis sat abrupte aut sensim dilatatis, regularibus, parte superiore aut margine scyphi solo soresioso granulosoque, parte inferiore usque ad aut supra medium corticata, acidum laeovusnivicum et zeorinum (sec. Zopf l. c.) continentia. Apothecia coccinea. Sporae fusiformes aut oblongo-fusiformes, long. 0.008—0.012, crass. 0.0025—0.003 mm.

Obs. Modif. **decorata** Vain. l. c. III p. 229 (*Cl. cornucopioides* f. *decorata* Vain. l. c. I p. 172, Lich. Vib., 1878, p. 45, Fl. Tav. Or., 1878, p. 95, Adj. Lich. Lapp. I, 1881, p. 101), scyphis praerupte dilatatis, margine apotheciis rubris sessilibus coronatis, podetiis macris, brevibus, long. circ. 4—10 mm, leviter soresiosis, squamis destitutis instructa, nonnullis

locis collecta. — *F. albida* Vain., podetiis albis, KHO flavescentibus, addito CaCl_2O_2 distinctius lutescentibus. In fissura rupis in Rofholm prope Tvärminne in N. (E. Häyrén). Podetia verruculoso-subgranulosa.

Var. *frondescens* (Nyl.) Vain.

Mon. Clad. III p. 229, I p. 157. *Cl. frondescens* Nyl. Fl. 1876 p. 571 (Hue Addend. I, 1886, p. 29).

Podetia plus minus sorediosa, squamosa. Apothecia coccinea.

Distr. In latere muscoso rupis in Enonsaari in par. Hollola in Ta. (Vain.).

Var. *cerina* (Nagel) Th. Fr.

Lich. Scand. I (1871) p. 74; Vain. l. c. I p. 172, III p. 229. *Cl. cerina* Nagel in Rabenh. Lich. Eur. Exs. X (1857) n. 303; Ohlert Verz. Preuss. Flecht. (1863) p. 16, Zusamm. Lich. Preuss. (1870) p. 5. *Cl. pyxidata* var. *cerina* Nyl. in Bot. Zeit. 1861 p. 352.

Podetia plus minus sorediosa. Apothecia partim pallida, partim aurantiaco-rubescencia.

Distr. Ad saxa prope Hersala in par. Hollola in Ta. (Vain.).

Obs. Var. *pleurota* in var. *stemmatinam* saepe notis morphologicis transit, nec hae species autonomas constituere possunt, quamquam v. *pleurota* zeorinum continet. Specimina talia transeuntia, quae sec. Sandst. (Clad. Nordw. Tiefl. II p. 355) morphologice similia sunt v. *stemmatinae* et in eodem caespite partim etiam sorediosa, observante Zopf (Beitr. Chem. Morph. Clad. p. 64), zeorinum continent, quare absentia zeorini in v. *stemmatina* non omnino constans videtur.

11. *Cl. deformis* Hoffm.

Deutschl. Fl. (1796) p. 120 (excl. syn.); Vain. l. c. I p. 186, III p. 230. *Lichen* L. Spec. Plant. (1753) p. 1152 p. p. ?; Ach. Lich. Suec. Prodr. (1798) p. 189.

Exs. Fr. Lich. Suec. Exs. V (1825) n. 148. — Havaas Lich. Exs. Norv. (1901) n. 71. — Malme Lich. Suec. Exs. XXII (1915) n. 533. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 633, 634.

Thallus primarius vulgo demum evanescens. Podetia vulgo scyphifera, elongata, late aut saltem parte superiore et fossa scyphi dense farinoso-sorediosa, sorediis subtilibus, KHO haud lutescentia, parte inferiore corticata.

Distr. Ad terram turfosa, humosa, muscos putridos, rarius ad ligna putrida et terram arenosa, locis apricis siccis aut subhumidis, velut in ericetis, campis deustis, tur-

fosis praesertimque deustis, rupibus et pinetis crescit, frequenter vel sat frequenter toto territorio usque ad Mare Glaciale proveniens.

Podetia long. circ. 90—25, basi crass. circ. 1—5 mm, tabulato infimo elongato, scyphis sensim vel abrupte dilatatis, circ. 5—8 (3—10) mm latis, margine subintegro vel dentato vel demum lacerato-radiato proliferove, sorediis circ. 0.015—0.030 mm latis, partibus sorediosis sulfureis aut stramineo-flavescentibus, acidum laevo-usniticum et zeorinum et parciissime duas alias exactius haud cognitatas materias continentia (sec. Zopf in Liebig's Ann. Chem. 313 p. 328, Flechtenst. p. 406, Beitr. Chem. Mon. Clad. p. 69). Sporae oblongae aut oblongo-ellipsoideae, long. circ. 0.009 (0.008—0.010), crass. 0.0025—0.003 mm. Conidia cylindrica, recta vel p. p. curvata, long. 0.008—0.011, crass. vix 0.001 mm. Gonidia ad Cystococcum glomeratum (sec. Warén Reink. Flechteng. p. 59) pertinentia.

Obs. Modif. *extensa* (Hoffm.) Vain. l. c. III p. 230 (I p. 192), Norrl. et Nyl. l. c. n. 633 (*Cl. extensa*, *Cl. coccinea* v. *extensa* Hoffm. Deutschl. Fl., 1796, p. 123), scyphis dilatatis, margine lacerato-proliferis, praesertim in turfosis sat frequenter obviam. — *F. cornuta* Torssell (Vain. l. c. III p. 230, I p. 194, *Cl. deformis* **cornuta* Torssell Enum. Lich. Scand., 1843, p. 28), podetiis ascyphis instructa, parce collecta.

Var. *ochrocarpia* Torssell.

Vain. l. c. I p. 196, III p. 230. *Cl. deformis* **ochrocarpia* Torssell Enum. Lich. Scand. (1843) p. 28. *Cl. crenulata* d. *pallescens* Laur. in Koerb. Par. Lich. (1859) p. 12. *Cl. deformis* β. *pallescens* Krempelh. Lich. Bay. (1861) p. 104; Vain. in Meddel. Soc. F. Fl. Fenn. XIII (1886) p. 239; Bot. Not. 1886 p. 32.

Apothecia pallida.

Distr. Ad terram turfosam in palude turfoso prope Herala in Hollola in Ta. (Vain.).

Podetia long. circ. 35—40, crass. 1—2.5 mm, scyphis sensim aut abrupte dilatatis, margine dentato aut saepius demum prolifero, proliferationibus fertilibus brevibusque, tabulato inferiore elongato, sorediis circ. 0.015—0.025 mm latis, etiam cavitatibus scyphorum subtilissime farinoso-sorediosis, parte inferiore corticata. Sporae long. circ. 0.007—0.008, crass. 0.0025 mm.

12. *Cl. bellidiflora* (Ach.) Schaer.

Lich. Helv. Spic. (1823) p. 21 p. maj. p.; Floerk. Clad. Comm. (1828) p. 95; Vain. l. c. I p. 198, II p. 445, III p. 230. *Lichen (Scyphophorus) bellidiflorus* Ach. Lich. Suec. Prodr. (1798) p. 194.

Exs. Fr. Lich. Suec. Exs. VIII (1826) n. 281. — Th. Fr. Lich. Exs. Scand. I (1859) n. 12. — Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 446, cont. (1921) n. 632. — Havaas Lich. Exs. Norv. (1902) n. 87, 88. — Zahlbr. Krypt. Exs. Vindob. XXIII (1915) n. 2273. — Malme Lich. Suec. Exs. XXVIII (1917) n. 679.

Thallus laciniis crassioribus latioribusque. Podetia vulgo elongata, subcylindrica aut tubaeformia, p. p. ascypha subulataque, p. p. scyphifera, scyphis angustis, regularibus, corticata, sorediis destituta, typice squamosa, raro squamis destituta, substraminea, hyphis tenuibus.

Distr. Ad terram humosam et muscos destructos locis apricis supra rupes et ad terram in campis arenosis in regionibus silvaticis et subalpinis crescit, in provinciis meridionalibus et mediis sat rara et in provinciis septentrionalibus passim vel sat frequenter proveniens.

Var. *coccocephala* (Ach.) Vain.

l. c. I p. 204, II p. 230. Exs. supra indicata.

Podetia elongata, squamosa, scyphifera aut ascypha. Thallus primarius squamis haud elongatis. Apothecia coccinea.

Distr. supra indicata.

Est forma typica hujus speciei. Thallus primarius long. circ. 2—5 mm, laciniatus crenatusve, crass. 0.014—0.34 mm, sorediis destitutus. Podetia proliferationibus diu accrescentia et basi saepe simul morientia, long. 20—50 (—80), crass. 0.7—3 (0.5—6) mm, scyphis brevibus et angustis, circ. 2—5 (—7) mm latis. Sporae fusiformes — oblongae, long. 0.009—0.012, crass. 0.0025—0.035 mm. Conidia cylindrica, curvata, long. 0.007—0.008, crass. vix 0.001 mm. Podetia acidum squamaticum et bellidiflorinum et paulum acidum usnicum et zeorinum continentia sec. Zopf Flechtenst. p. 53, 260, 332, 406, et Beitr. Chem. Mon. Clad. p. 67, 99.

Obs. F. *tubaeformis* (Wallr.) Flot. Lich. Fl. Siles. (1849) p. 37, Vain. l. c. III p. 230 (*Patellaria coccinea* g. *polycephala* B. *tubaeformis* Wallr. Naturg. Säulch.-Flecht., 1829, p. 176, Vain. l. c. I p. 207), podetiis scypho terminatis, et f. *subuliformis* (Wallr.) Rabenh. Deutschl. Krypt.-Fl. II (1845) p. 100 (*P. coccinea* f. *subuliformis* Wallr. l. c. p. 174, Vain. l. c. I p. 205), podetiis apice subulatis, valde inconstantes sunt, saepe in eodem caespite obvenientes, quod indicat hanc notam haud bene hereditariam esse, sed etiam caespites uniformes proferunt.

Var. *Hookeri* (Tuck.) Nyl.

Syn. Lich. (1860) p. 221, Lich. Scand. (1861) p. 60; Th. Fr. Lich. Scand. (1871) p. 65; Vain. l. c. I p. 209, II p. 446, III p. 230. Cl. *Hookeri* Tuck. Syn. Lich. New Engl. (1848) p. 55.

Podetia elongata, scyphifera, squamis destituta aut demum parce squamosa. Apothecia coccinea.

Distr. In Fennia haud collecta. Ad Storlien in Norvegia (J. P. Norrlin). Specimen ad Hammerfest a Cap. Ross collectum, a Nyl. commemoratum, huc non pertinet, squamis minutis numerosis instructum.

Var. *diminuta* Vain.

l. c. I p. 209, III p. 230.

Thallus primarius persistens aut demum evanescens, squamis mediocribus aut parvis. *Podetia* brevia aut brevissima, simplicia. Apothecia coccinea.

Distr. Inter muscos loco sicco in rupe ad Hiidenportti in par. Nurmes in Kb. (Vain.). Kurensalo in par. Puumala in Sa. (E. Nylander).

Podetia sparsa, long. 2—8, crass. 0.5—1 mm, apotheciis terminata, ascypha aut raro minute scyphifera, squamis destituta aut squamosa, cortice disperso aut decorticata.

Var. *praefoliosa* Nyl.

in Kihlm. (Kairamo) Neue Beitr. Flecht. Kola (1891) p. 46; Vain. l. c. II p. 445, III p. 230.

Thallus primarius squamis elongatis.

Distr. Ad terram humosam in silva mixta ad Lovosersk in LTul. (A. O. Kairamo).

Thallus primarius squamis —25 mm longis, adscendentibus, caespitem formantibus, sorediis destitutis, ad ambitum sat angustis, p. p. inferne sparse areolato-corticatis. *Podetia* haud evoluta.

Var. *ramulosa* Vain.

l. c. I p. 210, III p. 230.

Podetia brevia, ascypha, ramosa. Apothecia coccinea.

Distr. Ad fragmenta putrida plantarum in campo sicco aprico in insula Mjölö prope Helsingforsiam (Vain.).

Habitu subsimilis est *Cl. cristatellae* Tuck. Thallus primarius squamis sat parvis, demum evanescens. *Podetia* long. 10—20, crass. 0.7—2 mm, apotheciis terminata aut sterilia, apicibus sat obtusis, irregularia, flexuosa vel curvata, erecta vel decumbentia, apice vel apicem versus irregulariter ramosa, ramis radiatis vel fasciculatis aut dichotomis, vulgo divaricatis, brevibus vel sat brevibus, corticata, squamis destituta aut parce squamosa. Apothecia coccinea.

Var. *ochropallida* Flot.

Fl. 1836 Beibl. p. 56; Vain. l. c. I p. 211, III p. 230.

Apothecia pallida vel ochraceo-pallida. Podetia elongata, plus minus squamosa, ascypha aut scyphifera, cortice continuo.

Distr. *Hucusque tantum e Suecia et Germania est cognita.*

Ser. B. *Ochrophaeae* Vain.

l. c. I p. 223, III p. 231.

Apothecia fusca aut testacea aut pallida. Conidangia nigra aut fusca aut raro pallida cinerascentiave.

α. *Unciales* (Del.) Vain.

Thallus primarius mox evanescens aut raro persistens. Podetia apice diu accrescentia et vulgo simul basi morientia, vulgo ramosissima, sorediis destituta, squamis destituta aut raro basi parce squamosa, lateribus typice integris, flavida aut raro atypiceque albida, acidum laevo-usnicum continentia (sec. Zopf Beitr. Chem. Mon. Clad. p. 99). Apothecia parva aut rarius majora, subcorymbosa, peltata basi que bene constricta, rarius suffulta, pallida aut rarius fusca. Conidangia saepe materiam coccineam continentia.

13. *Cl. amaurocraea* (Floerk.) Schaer.

Lich. Helv. Spic. (1823) p. 34, (1833) p. 301; Vain. l. c. I p. 243, II p. 448, III p. 232. Capitularia Floerk. Besch. Braunfr. Becherfl. (1810) p. 334.

Exs. *Fr. Lich. Suec. Exs. XII (1852) n. 347. — Sommerf. Plant. Crypt. Norv. (1826) n. 161. — Stenh. Lich. Suec. Exs. n. 201. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 82—84, IX (1882) n. 450, cont. (1921) n. 635—638. — Havaas Lich. Exs. Norv. (1902) n. 90, 91. — Malme Lich. Suec. Exs. XXIX (1918) n. 701.*

Thallus primarius mox evanescens. Podetia vulgo sat tenuia, typice scyphifera aut saepe etiam ascypha, dichotome vel sympodialiter ramosa, axillis clausis aut parce perviis, cortice vulgo disperso, acidum destincticum haud continentia, strato chondroideo indistincte limitato. Conidangia nucleo albido.

Distr. *Ad muscos et terram humosam supra rupes et in campis apricis ericetisque et in tundris regionum arcticarum frequenter aut sat frequenter.*

Thallus primarius raro evolutus, squamis circ. 0.5—1.7 mm longis latisque: Podetia long. circ. 15—120, crass. vulgo 0.7—1.5 (0.5—3.5) mm, scyphis vulgo sat praerupte dilatatis, usque ad 5 mm latis, membrana integra aut perforata cribrosave clausis aut raro fortuitoque demum apertis, sat regularibus aut demum obliquis, dichotome aut sympodialiter aut rarius irregulariter aut (praesertim e margine scyphorum) radiatim ramosa, apicibus sterilibus sensim attenuatis gracilibusque aut scyphis terminata, corticata, cortice continuo aut saepius areolato dispersoque, squamis destituta aut raro basi parcissime squamulosa, KHO cum CaCl_2O_2 lutescentia aut raro immutata (et tunc e materia straminea destituta), acidum laevo-usninicum, coccellicum et cenomycinum continentia (sec. Zopf Beitr. Chem. Mon. Clad., 1908, p. 96, 99, 111), strato chondroideo circ. 0.025—0.080 mm crasso, sine limite distincto in stratum medullare exterius transeunte. Apothecia vulgo mediocria, 0.7—2 aut rarius —3.5 mm lata, peltata aut suffulta, pallescentia aut testacea aut livido-fusca fuscave. Sporae oblongo-fusiformes aut oblongae aut oblongo-ovoideae, long. 0.008—0.014, crass. 0.0025—0.0035 mm. Conidia cylindrica et maxima parte subfusiformia, leviter curvata, long. 0.007—0.009, crass. 0.0015 mm. Conidangia intus albida et materiam rubram haud continentia.

F. celotea Ach. in Schaer. Lich. Helv. Spic. I (1823) p. 35, Vain. l. c. I p. 249, 254, III p. 232. Podetia straminea, crassiora (0.7—3.5 mm), scyphifera. Est status normalis. — Exs. Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 638.

F. oxyceras (Ach.) Oliv. Étud. Clad. (1885) p. 224, Vain. l. c. I p. 254 (249), III p. 232 (*Cenomyce oxycera* Ach. in Vet. Ac. N. Handl., 1810, p. 301, Lich. Univ., 1810, p. 557 a). Podetia straminea, crassiora, ascypha, increbre dichotome ramosa, ramis longioribus. Item est status sat normalis.

F. craspedia (Ach.) Schaer. Lich. Helv. Exs. XI (1836) n. 273, Vain. l. c. I p. 254 (450), III p. 232 (*Cenomyce oxyceras* f. *craspedia* Ach. in Schaer. Lich. Helv. Spic., 1823, p. 34). Podetia straminea, crassiora, ascypha, crebre irregulariter ramulosa. Est status abnormis, forsan etiam in Fennia proveniens.

F. tenuisecta Vain. l. c. II p. 448, III p. 232. Podetia straminea, tenuissima, 0.3—0.5 mm crassa, abundanter ramosa, ascypha aut scyphifera. Analoga est *Cl. gracili* v. *gracillimae*. Ad plantas destructas supra rupem in Krunninmäki ad Humppila in Lohja in Ab. (C. E. Boldt). Status ad hanc formam accedens prope Läskelä in Kirjavahti prope Sortavala in KLad. (J. P. Norrlin, Norrl. et Nyl. Herb. Lich. Fenn. cont., 1921, n. 637).

F. furcatiformis (Nyl.) Vain. l. c. I p. 253, 254, III p. 233 (*Cl. crispata* **furcatiformis* Nyl. Fl. 1874 p. 318, Hue Addend., 1886, p. 28).

Podetia partibus decorticatis albis, partibus corticatis subolivaceis vel glaucescentibus, partim scyphifera, KHO cum CaCl_2O_2 non reagentia (forsan acidum laevo-usnicum non continentia). Ad Selkiinkallio in par. Pieksämäki in Sb. (Vain.). Ad Perttiniemi in KOn. (Th. Simming, n. 39740 in herb. Nyl. p. p.). — Specimina ad Uusikartano in Hollola in Ta. collecta (Norrl. et Nyl. Herb. Lich. Fenn. cont., 1921, n. 635) in f. *furcatiformem* et f. *oxycladam* transeunt, podetiis KHO cum CaCl_2O_2 levissime lutescentibus aut non reagentibus.

F. *oxyclada* Vain. Podetia ascypha, partibus decorticatis albis, KHO cum CaCl_2O_2 non reagentia. Supra muscos in rupibus ad Perttiniemi in KOn. (Th. Simming, n. 39740 in herb. Nyl. p. p.). Specimina in Norrl. et Nyl. l. c. (1921) n. 635 (c) podetiis crassioribus, crebrius ramosis a planta Karelica differunt.

Obs. *Cl. amaurocraea* f. *dstricta* Nyl., Lich. Scand. (1861) p. 59 (Vain. l. c. I p. 252), sec. specim. orig. in Degerö ad Helsingforsiam lectum lusus est parum notabilis hujus speciei, podetiis circ. 0.5—0.7 mm crassis, ascyphis, dichotome ramosis, flexuosis subimplexisque, stramineo-glaucescentibus. Huic proxima est Norrl. et Nyl. Herb. Lich. Fenn. cont. (1821) n. 636. Subsimilis est *Cladina amaurocraea* **Cl. dstricta* Nyl. in Norrl. Öfvers. Torn. Lapp. (1873) p. 321 et *Cladina dstricta* Nyl. in Brenner Bidr. Høgl. Lafv. (1885) p. 30. Diversa et *Cl. dstricta* Zopf in J. Liebig's Ann. Chem. 327 (1903) p. 335 (*Cl. Zopfii* Vain.).

Cladina amaurocraea f. *fruticulascens* Norrl., Herb. Lich. Fenn. II (1875) n. 84 (Vain. l. c. I p. 253), est status morbosus *Cl. amaurocraeae*, podetiis 1—0.7 mm crassis, ascyphis, glaucescenti-stramineis, totis aut apicem versus curvatis, capreolato-ramosis, constipatis aut caespitoso-implexis, parte superiore aut apice morbose subtumesciente et fusconigricante, latere passim spinuloso. Ad f. *craspediam* (Ach.) accedens.

Cladina amaurocraea f. *constipata* Norrl., Herb. Lich. Fenn. II (1875) n. 83 (Symb. Lich. Kar. Ladog., 1878, p. 24, Vain. l. c. I p. 253), est lusus podetiis 50—120 mm longis, 0.7—0.5 mm crassis, erectis, crebre constipatis, ascyphis, stramineis aut passim parcius glaucescentibus, apice fuscescentibus, dichotome subfastigiatis, ramis patulo-erectis, saepius elongatis.

Cl. Zopfii Vain.

in Meddel. Soc. F. et Fl. Fenn. 45 (1920) p. 4, 306. *Cladina dstricta* Zopf in J. Liebig's Ann. Chem. 327 (1903) p. 335, Flechtenst. (1907) p. 260, 331, 408, Beitr. Chem. Mon. Clad. (1908) p. 95, 99; Hesse in Journ. für Prakt. Chem. 70 (1904) p. 450, 83 p. 62; Sandst. Clad. Nordw. Tiefl. p. 409, tab. I f. 2 (Abh. Nat. Ver. Brem. XVIII, 1906), II (1912) p. 357. Haud *Cl. amaurocraea* f. *dstricta* Nyl. Lich. Scand. (1861) p. 59 (videas supra).

Exs. Zwackh Lich. Exs. (1886) n. 968 a, b, (1888) n. 996. — Rehm Clad. Exs. (1890) n. 377. — Zahlbr. Krypt. Exs. Vindob. VIII (1902) n. 755 a, b. — Migula Krypt. Exs. (1902) n. 3 (sec. Sandst. l. c. I p. 410).

Thallus primarius mox evanescens. Podetia subcinereo-glauescentia, sat tenuia aut modice incrassata, ascypha aut scyphis sat obsoletis, diaphragmate subintegro clausis instructa, crebre dichotome et parcius polychotome ramosa, axillis clausis, cortice vulgo subcontinuo, strato corticali ex hyphis sublongitudinalibus formato obducta, strato chondroideo distincte limitato, acidum destrieticum continentia. Conidangia nucleo albido.

Distr. Ad terram arenosam in campis et ad terram in lateribus paludum in Germania et in insulis australibus Maris Septentrionalis et in Dania suis locis abundanter provenit. In Fennia nondum est collecta.

Cl. amaurocraeae proxime est affinis, podetiis ab ea differens nec distincte flavescentibus nec stramineis, alio modo variabilibus, nec omnino eodem modo ramosis et alias materias continentibus. Notae chemicae autem in hoc casu a lichenologis vix adhibendae sint. Crystalla sphaeroidea cyanea acidi destrieticum e solutione aetherea rubricoso-violacea recipiuntur sec. Zopf Flechtenst. p. 332. Podetia long. circ. 30—60, crass. 0.5—1.2 mm, scyphis vulgo radiato-ramosis, apicibus sterilibus minus attenuatis, quam in *Cl. amaurocraea*, squamis destituta, KHO cum CaCl_2O_2 lutescentia, KHO solo non reagentia, acicum laevo-usnicum, squamicum, destrieticum, destrieticum, cladestenicum et cladestinum (sec. Zopf Flechtenst. p. 408, Hesse in Journ. f. Prakt. Chem. B. 70 p. 450, 453, B. 83 p. 62, Sandst. Clad. Nordw. Tiefl. II p. 359), parietibus 0.160—0.100 (—0.060) mm crassis. Stratum corticale podetiorum evanescens aut passim 0.020—0.030 mm crassum, ex hyphis formatum longitudinalibus aut sat irregulariter dispositis, 0.010 (—0.008) mm crassis, partim conglutinis, cavitatibus cellularum tenuissimis, membranis gelatinoso-chondroideis, incrassatis, dispersum et in stratum medullare transiens. Stratum medullare exterius hyphis disjunctis, cum strato chondroideo mixtum fibras formante sparsas, ex hyphis constantes 0.008—0.010 mm crassis, pachydermatibus, conglutinis, sed distincte limitatis. Stratum chondroideum diversum haud evolutum. Apothecia incognita (conf. Sandst. l. c. II p. 358). Conidangia stipite brevi praesertim apicibus et axillis, parcius etiam lateribus podetiorum affixa, subsolitaria, circ. 0.2 mm lata, subcylindrica, basi leviter constricta, nigricantia, ostiolo parvo,

nucleo albedo, materiam coccineam non continentia, hyphis parietalibus ad basin sterigmatum materia subpallida incrustatis. Sterigmata long. 0.030 (—0.015), crass. 0.002 mm, saepe basin versus aut rarius latere ramosa, ramis saepe basin versus levissime ventricosis, apices versus sensim attenuata, 2-(—1)-septata, apicibus conidia efferentibus. Conidia subcylindrica (vel subfusiformia microscopio bene multiplicante visa), leviter curvata, long. 0.007—0.008 (—0.006), crass. 0.0007 mm. Thallus primarius nondum visus.

14. *Cl. uncialis* (L.) Web.

in Wiggers Prim. Fl. Hols. (1780) p. 90 n. 995 p. p.; Hoffm. Deutschl. Fl. II (1796) p. 117 (Vain. Rev. Lich. Hoffm. p. 19); Vain. l. c. I p. 254, II p. 448, III p. 254. *Lichen uncialis* L. Spec. Plant. (1753) p. 1153 n. 66 p. p.

Exs. Fr. Lich. Suec. Exs. III (1824) n. 87, VIII (1826) n. 237. — Stenh. Lich. Suec. Exs. ed. 2 n. 210. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 81, cont. (1921) n. 640—648. — Zwackh Lich. Exs. (1882) n. 693—697, (1886) n. 967, (1888) n. 1036 A—D. — Rehm Clad. Exs. (1883) n. 236—238, 243. — Arn. Lich. Exs. (1883) n. 984, (1897) b, (1884) 1021 a, b, 1022, 1035. — Malme Lich. Suec. Exs. XII (1912) n. 277.

Thallus primarius mox evanescens. Podetia vulgo sat tenuia, ascypha, polychotome aut rarius dichotome ramosa, axillis vulgo perviis, strato chondroideo haud distincte limitato, cortice vulgo disperso, acidum dstrictinicum haud continentia. Conidangia nucleo dilute coccineo.

Distr. Ad muscos et terram humosam supra rupes et in campis apricis ericetisque et in tundris regionum arcticarum frequenter aut sat frequenter.

Thallus primarius raro evolutus, mox evanescens, squamis circ. 0.5 (—1) mm longis latisque. Podetia long. circ. 20—80 (—110) mm, crass. 1—1.5 (0.7—4) mm, ad axillas vix aut saepe leviter dilata, diaphragmate scyphi destituta, apicibus subulatis aut radiato- vel furcato-spinulosis, squamis destituta, acidum laevo-usninicum et thamnolicum continentia (sec. Zopf in J. Liebig's Ann. Chem. 324 p. 71, Flechtenst. p. 408). Apothecia parva, lat. 0.5—0.8 mm, peltata basique bene constricta, testaceo-pallida aut livido-fuscescentia fuscave. Sporae fusiformes aut oblongae, long. 0.010—0.015 (—0.008), crass. 0.003—0.0035 mm. Conidia subcylindrica, leviter curvata long. 0.006—0.007, crass. vix 0.001 mm.

F. obtusata Ach., Vain. l. c. I p. 263, 270, III p. 233 (*Cenomyce obtusata* Ach. in Floerk. Beisp. Unnat. Trenn., 1809, p. 100). Podetia straminea, polychotome ramosa, apicibus obtusis, axillis haud aut parum dilatatis, rhizinis destituta. Est forma frequentissima hujus speciei. Huc pertinet Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 81, cont. (1821) n. 644, 645.

F. subobtusata Arn. Lich. Jur. (Fl. 1885) p. 306 (229), Vain. l. c. I p. 263, III p. 233 (Coem. Clad. Belg. II, 1866, n. 123, specim. dextr.), axillis podetiorum dilatatis et rhizinis nigricantibus instructis a *f. obtusata* differens. — Huic proximus est Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 646, „loco humidior in rupe ad Aquaeductum Helsingforsiae“ collectus (Norrl.).

F. dicraea Ach., Vain. l. c. I p. 263, III 233 (*Baeomyces uncialis* β . *B. dicraeus* Ach. Meth. Lich., 1803, p. 353). Podetia straminea, dichotome ramosa, apicibus subulatis, axillis p. p. perviis. Haud rara.

F. integerrima Vain. in Zwackh Lich. Exs. (1886) n. 967, Mon. Clad. Univ. I (1887) p. 270, III p. 233. Podetia straminea, dichotome ramosa, apicibus subulatis, axillis clausis. Supra muscos in rupibus locis cultis ad Helsingforsiam (Vain.).

F. turgescens Del., Vain. l. c. I p. 265, 270, III p. 233 (*Cenomyce uncialis* η . *turgescens* Del. in Dub. Bot. Gall., 1830, p. 620). Podetia partibus corticatis glaucescentibus, partibus decorticatis albidis, KHO cum CaCl_2O_2 lutescentia, vulgo crassa. Huc pertinent Rabenh. Clad. Eur. (1860) tab. XXIX n. 12, 13, Zwackh Lich. Exs. (1882) n. 697, (1888) n. 1036 B, C. N.: Ad Ingels in Kyrkslätt (H. Lindberg). Ka.: Prope Templum in Kakki (C. E. Boldt). KLad.: Havuvaara in Soanlahti (G. Lång). KOL.: Kalliolinna ad Schtjeliki (F. Elfving). Oa.: Orismala in Isokyrö (P. Nederström). Ob.: Simo (V. Räsänen).

F. rimulosa Vain. Podetia abundanter rimulosa, turgescencia, flavida, sat irregulariter ramosa, apicibus obtusis aut ramulis minutis terminata. Ad *Cl. reticulatam* accedens. Supra muscos (Dicranum) in Ristiina in Sa. (E. Nylander a. 1852 legit).

β . **Chasmariae** (Ach.) Floerk.

Thallus primarius bene evolutus, persistens aut demum evanescens. Podetia basi persistente aut emoriente, ascypha aut scyphifera, ramosa aut simplicia, albida aut glaucescentia aut fusciscentia aut raro flavescencia, axillis p. p. perviis aut rarius omnibus subclausis, fragilia. Apothecia parva aut raro majora, peltata basique constricta, saepe in corymbis aut coronis disposita, in apicibus ramulorum vulgo aggregata,

primum vulgo tenuissime marginata, fusca aut livido-fusca aut rarius testacea pallidave. Conidangia saepe materiam coccineam continentia.

a. *Microphyllae* Vain.

Thallus primarius squamis parvis aut raro elongatis, angustis aut anguste partitis vel anguste crenatis.

15. *Cl. furcata* (Huds.) Schrad.

Spic. Fl. Germ. (1794) p. 107. — Pers. Bem. Flecht. (1794) p. 19. — Floerk. Clad. Comm. (1828) p. 141 p. p. — Vain. Mon. Clad. Univ. I (1887) p. 316, II (1894) p. 450, III (1897) p. 239. — *Lichen furcatus* Huds. Fl. Angl. (1762) p. 458 n. 69. — Schreb. Spic. Fl. Lips. (1771) p. 117 n. 1106. — *L. cornutus* L. Spec. Plant. (1753) p. 1152 n. 63 p. p.

Exs. Ehrh. Pl. Crypt. (1789) n. 108. — Schrad. Syst. Samml. Crypt. (1797) n. 130. — Fr. Lich. Suec. Exs. II (1818) n. 58, IV (1824) n. 117. — Nyl. Herb. Lich. Par. I (1855) n. 22, 23. — Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 433—435, cont. (1921) n. 677—679. — Malme Lich. Suec. Exs. XXI (1915) n. 511, XXII (1915) n. 527, XXVIII (1917) n. 680.

Thallus primarius vulgo demum evanescens. Podetia vulgo longa aut sat longa, sat tenuia aut sat crassa, inaequaliter subcylindrica, ascypha (aut raro scyphifera), axillis vulgo perviis, esorediosa aut raro parce solediosa, laevigata aut raro subrugulosa asperatave, esquamulosa aut squamosa aut raro squamulosa, impellucida, glaucescentia albidave aut subfuscescentia, KHO vulgo fere —, CaCl_2O_2 non reagentia, strato chondroideo crasso, distincte limitato. Conidangia vulgo ovoidea basique bene constricta, materiam coccineam non continentia.

Distr. Inter muscos et ad terram humosam locis apricis et subumbrosis in silvis siccis et supra rupes et saxa, ad terram arenosam humosamve in campis apricis. In Lapponia passim aut sat rare, ceterum toto territorio frequenter vel sat frequenter provenit. LKem.: Nonnullis locis in reg. Coniferarum, in silva ad Muonio (Norrl. Ber. Torn. Lappm. p. 320). LEnont.: In reg. subsilv. inter Songanmuotka et Palojoki, in reg. pinifera ad Hetta (Norrl., mus. Fenn.) et

ad Kilpisjärvi (Norrl. l. c.). LIn.: In reg. pinifera ad lacum Inarijärvi, in reg. subalp. montium Hammastunturit et in reg. betulina ad Kängäs prope Mare Glaciale (Vain. Adj. Lich. Lapp. I p. 113). LIm.: In pineto ad Tuillusht prope lac. Umpjawn (A. O. Kairamo). LTul.: Ad Kuolla (N. I. Fellman, mus. Fenn.).

Thallus primarius squamis circ. 5—2 mm longis latisque, 0.11—0.20 mm crassis, vulgo usque ad medium laciniatis, laciniis crenatis, circ. 1.5—0.5 mm latis. Podetia long. circ. 15—80 (—150) mm, crass. vulgo circ. 0.7—2 mm, pluries dichotome aut minus saepe sympodialiter ramosa aut irregulariter subcorymbosa, axillas versus sensim incrassata aut axillis dilatatis, perviis vel fissis (in var. *paradoxa* diaphragmate clausis), apicibus sensim attenuatis aut obtusiusculis, corticata, cortice continuo aut disperso, aut partim decorticata, parietibus circ. 0.110—0.310 mm crassis, hydrate kalico non reagentia vel demum olivaceo-flavescentia aut sordide fuscescentia, aut primo dilute lutescentia, sec. Zopf Beitr. Chem. Mon. Clad. (1908) p. 88 et 89 acidum fumarprotocetraricum (1.5 %) et paulum acidum atranoricum continentia. Stratum corticale et str. medullare exterius podetiorum bene evoluta. Stratum chondroideum circ. 0.08—0.2 mm crassum, pellucidum, membranis hypharum conglutinatiss, haud distincte limitatis. Apothecia lat. circ. 0.5—1 (—1.5) mm, in apicibus ramorum subcorymbose aut irregulariter subradiatim cymoseve dispositorum parce aggregata aut subsolitaria, fere mox immarginata convexaque, peltata, ambitu deflexo, fusca aut testacea aut raro pallida. Sporae fusiformes oblongaeve aut ovoideae, long. 0.009—0.018, crass. 0.0035—0.0025 mm. Conidangia circ. 0.180—0.370 mm crassa, vulgo ovoidea aut ampullacea, rarius dolioliformia, basi vulgo bene constricta, raro cylindrica et basi haud constricta (defl. **subrangiformis** e Tiirismaa, hb. Vain. n. 451), fusca aut nigricantia. Conidia subcylindrica, vulgo leviter curvata, long. 0.005—0.006 (—0.008), crass. circ. 0.001 mm.

Var. *racemosa* (Hoffm.) Floerk.

Clad. 'Comm. (1828) p. 152; Vain. l. c. I p. 323, 326, III p. 239. *Cl. racemosa* Hoffm. Deutschl. Fl. II (1796) p. 114.

Podetia tota aut maiore parte albida vel glaucescentia, esorediata, squamis squamulisque destituta, laevigata, cortice vulgo subcontinuo.

Distr. Est variatio frequentior hujus speciei, praesertim locis subumbrosis proveniens.

F. furcatosubulata (Hoffm.) Vain. l. c. I p. 327, III p. 239. *Cl. furcata* *Cl. furcatosubulata* Hoffm. l. c. p. 115. — Exs. Norrl. et Nyl. Herb. Lich. Fenn. cont. (1821) n. 677.

Podetia subulata, sterilia (ceterum sicut supra indicatum), squamis destituta.

F. corymbosa (Ach.) Nyl. Herb. Mus. Fenn. (1859) p. 80, Syn. Lich. (1860) p. 207; Vain. l. c. I p. 328, III p. 239. *Cenomyce allotropa* var. *corymbosa* Ach. Lich. Univ. (1810) p. 556. — Exs. Malme Lich. Suec. Exs. XXI (1915) n. 511.

Podetia subcorymbosa, fertilia (ceterum sicut supra indicatum), squamis destituta.

Var. **pinnata** (Floerk.) Vain.

l. c. I p. 332, 334, III p. 239. *Cenomyce racemosa* var. *pinnata* Floerk. in Schleich. Cat. Absol. (1821) p. 47.

Podetia vulgo albida vel glaucescentia, esorediata, squamosa, vulgo sublaevigata, cortice subcontinuo aut areolato, areolis crebris.

Distr. Minus frequens, quam var. *racemosa*, et locis magis humidis proveniens (videas Vain. l. c. III p. 124).

F. foliolosa (Del.) Vain. l. c. I p. 333, 335, III p. 239. *Cenomyce racemosa* ζ. *foliolosa* Del. in Dub. Bot. Gall. (1830) p. 623. — Exs. Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 433 (specim. dextr.).

Podetia vulgo albida vel glaucescentia, esorediata, squamosa, vulgo sublaevigata, cortice subcontinuo aut areolato, sterilia apicibus sensim attenuatis subulatisque. Analoga f. *furcatosubulata* (Hoffm.).

Distr. Haud rara in prov. austr. et mediis. Ad Hetta in par. Enontekiäinen (J. P. Norrlin).

F. truncata Floerk. Clad. Comm. (1828) p. 145; Vain. l. c. I p. 333, 334, III p. 239. — Exs. Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 435, cont. (1921) n. 678, 679.

Podetia vulgo albida vel glaucescentia, esorediata, squamosa, vulgo sublaevigata, cortice subcontinuo aut areolato, vulgo fertilia subcorymbosaeque. Analoga f. *corymbosae* (Ach.).

Distr. Haud rara in prov. austr. et mediis. Ad Soukelo in Kker. (N. I. Fellman). Ad Muonio et Enontekiäinen in Lapponia (J. P. Norrlin).

Var. **scabriuscula** (Del.) Coem.

Vain. l. c. I p. 338, 341, 345, II p. 450, III p. 240. *Cenomyce scabriuscula* α. Del. in Dub. Bot. Gall. (1830) p. 623. „*Cl. furcata* B.

forma subulata, stricta, scabriuscula“ Coem. Clad. Belg. II (1866) n. 173 B.

Exs. Floerk. Deutsch. Lich. X (1821) n. 198. — Rabenh. Lich. Eur. Exs. X (1857) n. 278. — Rabenh. Clad. Eur. (1860) tab. XXXI n. 12, 13, tab. XXXIV n. 20. — Coem. Clad. Belg. II (1866) n. 173 B, 174, 175. — Zwackh Lich. Exs. (1884) n. 889, (1888) n. 1031 A, B, 1032, (1889) n. 1065, 1066, (1891) n. 1137. — Rehm Clad. Exs. (1889) n. 363. — Malme Lich. Suec. Exs. XXII (1915) n. 527.

Icon. Arn. Lich. Exs. (1888) n. 1342, 1343, (1889) n. 1430 p. p., 1431.

Podetia albidula vel glaucescentia, granulis instructa, cortice diffracto aut partim decorticata, saepe squamulosa squamosave aut plus minus isidiosa.

Distr. In pineto sabuloso Oelandiae in Suecia a G. E. Du Rietz collecta, sed in Fennia nondum observata. Planta nomine „*adpersae* Floerk.“ a Nyl. salutata (n. 39248 in herb. Nyl.) est *Cl. squamosa* scyphifera.

Var. *palamaea* (Ach.) Nyl.

Lich. Scand. (1861) p. 56; Vain. l. c. I p. 347, 350, III p. 240. *Baeomyces spinosus* γ. *B. palamaeus* Ach. Meth. Lich. (1803) p. 359.

Exs. Rabenh. Lich. Eur. Exs. X (1857) n. 275, 276. — Rabenh. Clad. Eur. (1860) tab. XXXI n. 8, 11. — Mudd Mon. Brit. Clad. (1865) n. 52, 59. — Coem. Clad. Belg. II (1866) n. 177—180, 196, 199. — Zwackh Lich. Exs. (1881) n. 641, (1883) n. 745. — Rehm Clad. Exs. (1869) n. 24, (1883) n. 230, 234. — Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 434 a.

Podetia maiore parte obscurata aut testaceo-pallida, esorediata, ascypha, squamis squamulisque destituta, laevigata, cortice subcontinuo.

Distr. Ad terram humosam atque arenosam in campis et aliis locis apricis siccis provenit. LIn.: In reg. subalp. montium Hammas-tunturit et in reg. betulina ad Kõngäs prope Mare Glaciale (Vain. Adj. Lich. Lapp. I p. 113). LTul.: Kuolla (N. I. Fellman). LENont.: In reg. pinifera inter Kaaresuanto et Maunu et ad Kilpisjärvi (Norrl. Ber. Torn. Lapp. p. 320). Nonnullis locis in Kb.: (Vain. l. c.). In Tavastia bor. et provinciis magis australibus sat frequens (*Cl. furcata* Vain. Fl. Tav. Or. p. 95, Norrl. Bidr. Sydöstr. Tav. Fl. p. 176).

Obs. *F. subulata* Floerk., Vain. l. c. I p. 351, III p. 240 (*Cenomyce furcata* var. *subulata* Floerk. Deutsch. Lich. X, 1821, p. 197, icone in Arn. Lich. Exs., 1889, n. 1418—1420). Podetia maiore parte superiore pallida, sterilia sensim attenuata, squamis destituta, laevigata, cortice subcontinuo instructa. Intermedia est inter v. *palamaeam* et v. *racemosam*, in ambas transiens. Pluribus locis visa.

Var. *paradoxa* Vain.

l. c. I p. 349, III p. 240.

Podetia partim fuscescentia aut olivacea, scyphis parvis, abortivis, irregularibus, membrana plus minus perforata clausis.

Distr. Ad plantas destructas supra saxa et in campis in Hollola et ad Kurkoja in Luhanka in Ta. (Vain.) et ad Vehmasmäki prope Kuopio in Sb. (K. Linkola).

Evidenter e var. *palamaea* est evoluta, podetiis numerosis in eodem caespite in eam transiens, nec sit vera forma systematica, sed potius deflexus accidentalis polyphyleticusque, tamen caespites podetia numerosa continentes formans. Podetia long. 40—10 mm, crass. 1—0.7 mm, scyphis 3—2 mm latis, sat praerupte dilatatis, irregulariter sublacerato-radiatis proliferisque, membrana subintegra aut perforata clausis, parcius etiam dichotome ramosa axillisque clausis, tabulatis 2—3, basin versus glaucescentia, scyphis aut apotheciis aut conidangiis terminata, esquamulosa aut basi parce squamosa. Podetia fertilia saepe etiam corymbos minores formantia aut rarius apotheciis subsolitariis terminata. Apothecia 0.5—1.5 mm lata, basi vulgo constricta, fusca aut rufescentia. Conidangia vulgo ampullacea aut dolioliformia, basi vulgo bene constricta. — Subsimilis, sed podetiis glaucescentibus et parce squamosis, scyphis abortivis, membrana perforata clausis, instructa, e f. *truncata* evoluta, supra saxa muscosa calcaria ad Valcourt in Belgio a Verheggen lecta est (n. 50 in herb. C. Aigret) et nominetur f. **scyphophora** Vain. Podetiis testaceo-variegatis instructa, collecta est in Mjölö prope Helsingforsiam (A. Kullhem).

Obs. A var. *paradoxa* distinguenda est **Cl. subcrispata** (Nyl.) Vain. (*Cl. furcata* var. *subcrispata* Nyl. in Linds. Mem. *Spermog.*, 1861, p. 168, *Cl. crispata* var. *subcrispata* Vain. l. c. I p. 385, III p. 241, in Fink Furth. Not. Clad. III, The Bryologist 1894, tab. VII f. 2 et 5 delineata), quae inter duas species, in diversas sectiones pertinentes, *Cl. furcatam* et *Cl. pityream*, est intermedia et habitu quasi hybrida, a praecedente podetiis typice scyphiferis et scyphis membrana integra aut perforata clausis et parietibus podetiorum tenuioribus, a posteriore apotheciis parvis et apicibus podetiorum fertilium subcorymbose ramulosis. Podetia numquam sorediosa, parce aut abundanter squamosa aut squamis destituta, corticata, raro tantum parce scyphifera (f. *subascypha*, n. 114 in coll. Finkii, e Flag Islandia in Am. sept.), albido-glaucescentia aut rarius superne testacea vel olivaceo-fuscescentia, qualia specimina obscurata ad v. *paradoxam* accedunt (f. *subtestacea*, conf. Fink l. c., 1904, p. 57, tab. VII f. 5). Specimina albido-glaucescentia ad f. *Finkii* Vain. pertinent (l. c. f. 2). In Minnesota pluribus locis (B. Fink) et in Newfoundland (A. Waghorne) collecta est. — Ab hac specie *Cl. Beaumontii* (Tuck.) Vain. (l. c. II p. 455) podetiis KHO intense lutescentibus differt.

Var. *rigidula* Mass.

Vain. l. c. I p. 354, 355, III p. 240. *Cl. furcata* var. *racemosa* f. *rigidula* Mass. Sched. Crit. (1855) p. 99, Lich. Ital. Exs. V (1856) n. 158 C.

Exs. Mass. l. c. — Hepp Flecht. Eur. IV (1867) n. 813.

Podetia majore parte obscurata aut testacea, esorediata, ascypha, squamosa, sed squamulis isidioideis destituta, cortice subcontinuo.

Distr. Praesertim ad plantas destructas supra saxa et rupes crescit. Prope Helsingforsiam et pluribus locis in Ta. legi. Kyrkslätt (A. Kullhem). Hoglandia (E. Nylander).

Var. *conspersa* Vain.

l. c. I p. 355, III p. 240.

Podetia testacea aut fuscentia, squamosa et apicem versus isidioideo-squamulosa, testacea aut fuscescentia, haud aut parum decorticata, cortice partim rimoso-diffracto.

Distr. Ad muscos destructos supra rupes littorales locis ventosis apricis. Mjölö prope Helsingforsiam (Vain.). Ostrobotnia austr. (A. J. Malmgren). Alandia (specimen ad v. *rigidulam* accedens, lect. ab E. Nylandro).

Intermedia inter v. *rigidulam* et v. *syrticam*, a posteriore squamis majoribus et podetiis parum decorticatis differens. Podetia esorediata, squamulis superioribus interdum subtus parce granulosis. Conidangia ovoidea, basi bene constricta.

Var. *syrtica* Ohlert

Zusamm. Lich. Preuss. (1870) p. 7 (Schrift. K. Phys.-ökon. Gesellschaft. XI); Vain. l. c. I p. 356, III p. 240; Sandst. Clad. Nordwestdeutsch. Tiefl. II (1912) p. 360.

Podetia testacea aut cinereo-fuscescentia, squamuloso-scapulosa aut isidioideo-squamulosa, squamis majoribus destituta, apicem versus saepe partim vel leviter decorticata ibique parce granulosa aut esorediata, cortice subcontinuo- et areolato- et verruculoso-variegato.

Distr. N.: Mjölö (C. W. Fontell). St.: Merikarvia (Sastmola) et Siikainen (A. J. Malmgren). Oa.: In Karijoki (Bötom) ab A. J. Malmgren collecta.

Specimina Fennica haud sunt typica, podetiis minus decorticatis, neque aut raro parciissimeque granulosis instructa. In specimine orig., ad Steegen in Borussia ab Ohlert collecto, podetia apice decorticata et p. p. granulosa vel increbre sorediosa, vix nisi colore cinereotestaceo a podetiis var. *scabriusculae* f. *surrectae* Floerk. differentia. — *Patellaria*

furcata β . *chnaumatica* Wallr. Fl. Crypt. Germ. (1831) p. 426 (Naturg. Säulch.-Flecht., 1829, p. 158) sec. icon. in Arn. Lich. Exs. n. 1342 sit *Cl. glauca* Floerk., ut jam a Wallr. indicatur.

16. *Cl. rangiformis* Hoffm.

Deutschl. Fl. II (1796) p. 114; Vain. l. c. I p. 357, II p. 451, III p. 236. *Lichen pungens* Ach. Lich. Suec. Prodr. (1798) p. 202. *Cladonia pungens* Ach. l. c.; Floerk. Clad. Comm. (1828) p. 156; Nyl. Lich. Paris (1896) p. 31.

Thallus primarius demum evanescens. Podetia longa aut sat longa, interdum sat brevia, tenuia aut sat crassa, aequaliter cylindrica, ascypha, vulgo crebre pluriesque dichotome ramosa, axillis clausis aut parcius perviis, esorediosa aut rarissime passim soorediosa, vulgo laevigata, impellucida, cortice vulgo maculas minutas formante, albida, maculis corticatis vulgo subglaucescentibus, aut rarius fuscescentia, KHO lutescentia, strato chondroideo tenui, indistincte limitato. Conidangia subcylindrica, basi haud constricta, materiam coccineam non continentia.

Distr. Ad terram arenosam humosamque, saepe etiam calcariam, locis aridis apricisque et supra rupes ad oram maris et in pinetis, umbrosis quoque, etiam locis arenosis apricis humidis. Al.: „Praesertim supra rupes ad oram maris numerose“ (E. Nylander Ålands Lafveg. p. 82 in Not. S. F. Fl. Fenn. III, 1856, mus. Fenn.). Ab.: Vidskär in Korpo (F. Elfving). N.: Ad Långskär (K. Linkola, J. Kivenheimo) et alibi ad Tvärminne, „supra scopulos exteriores praesertimque ad limitem maris“ (Häyrén Üb. Landveg. Meeresfels. p. 145), Mjölö (Vain.) et Torrmjölö (W. Nyl.) prope Helsingforsiam.

Thallus primarius squamis superne subtusque KHO lutescentibus. Podetia long. circ. 15—90 mm, crass. 0.5—2 mm, parietibus circ. 0.250—0.110 (partibus decorticatis —0.065) mm crassis, acidum atranoricum (sec. Zopf Ann. Chem. 288 p. 63, Paternò Gaz. Chim. 12 p. 256, Hesse Journ. Prakt. Chem. 57 p. 274) et rangiformicum (sec. Paternò l. c., Hesse l. c. p. 275, Zopf Flechtenst. p. 34) et alias materias exactius haud cognitatas (sec. Zopf Beitr. Chem. Mon. Clad. p. 90) continentia. Stratum corticale et medullare exterius podetiorum bene evoluta. Stratum

chondroideum circ. 0.05—0.08 mm crassum. Apothecia lat. circ. 0.7—0.5 (—1.2) mm, in apicibus ramorum subcorymbose aut irregulariter subradiatim cymoseve dispositorum parce aggregata aut subsolitaria, fere mox immarginata convexaque, peltata, ambitu deflexo, fusca. Sporae oblongae aut rarius ovoideo-oblongae aut elongatae, long. 0.008—0.024, crass. 0.003—0.004 mm. Conidangia circ. 0.170—0.220 mm crassa, subcylindrica aut dolioliformia aut ovoideo-cylindrica, basi non aut parum constricta, fusconigra. Conidia subcylindrica, leviter curvata, long. 0.005—0.007, crass. circ. 0.001 mm.

Var. *pungens* (Ach.) Vain.

l. c. I p. 361, II p. 451, III p. 236. *Lichen pungens* Ach. Lich. Suec. Prodr. (1798) p. 202.

Exs. Floerk. Deutsch. Lich. VIII (1821) n. 159. — Fr. Lich. Suec. Exs. XI n. 318. — Rabenh. Lich. Eur. Exs. X (1857) n. 277, Clad. Eur. (1860) tab. XXXII n. xxxiii 1, 2, 3, 6, tab. XXXIII n. 9—13, tab. XXXIV n. 15, 16, 18, 19, Supl. (1863) tab. XXXI n. 16, tab. XXXIV n. 21. — Mudd Mon. Brit. Clad. (1865) n. 54, 55. — Hepp Flecht. Eur. IV (1867) n. 816. — Trevis. Lich. Ven. (1869) n. 91. — Zwackh Lich. Exs. (1881) n. 643 A, B, 644. — Rehm Clad. Exs. (1883) n. 235 p. p., (1886) n. 292, (1887) n. 331. — Arn. Lich. Exs. (1895) n. 1644 a. — Zahlbr. Krypt. Exs. Vindob. XI (1904) n. 1034, XXII (1914) n. 2164. — Malme Lich. Suec. Exs. XI (1912) n. 252 (XXVI, 1917, n. 626 atypica).

Podetia tenuia aut sat tenuia, esorediosa, squamis destituta, apicibus sterilibus tenuibus subulatisque.

Dist. Supra indicata ex Alandia et Nylandia.

Est forma typica hujus speciei. Podetia sterilia crass. 0.5—0.7 (—1) mm, fertilia 0.5—1.5 mm, apicem versus interdum fuscescentia.

Var. *foliosa* Floerk.

Clad. Comm. (1828) p. 159; Vain. l. c. I p. 366, II p. 451, III p. 236. *Cenomyce rangiformis* var. *foliosa* Floerk. Deutsch. Lich. VIII (1821) p. 15, n. 158.

Exs. Rabenh. Clad. Eur. (1860) tab. XXXII n. xxxiii 5 p. p., Lich. Eur. Exs. XXXI (1869) n. 839. — Leight. Lich. Brit. Exs. (1861) n. 402. — Mudd Mon. Brit. Clad. (1865) n. 56. — Trevis. Lich. Ven. (1869) n. 81, 82, 88. — Rehm Clad. Exs. (1883) n. 235 p. p. — Lojka Lich. Univ. (1886) n. 156. — Arn. Lich. Exs. (1895) n. 1644 b. — Havaas Lich. Exs. Norv. (1902) n. 86. — Zahlbr. Krypt. Exs. Vindob. XIII (1905) n. 1238, XXIV (1916) 2355 p. p. (in v. *Euganeam* acced.).

Podetia tenuia aut sat tenuia, esorediosa, squamosa, apicibus sterilibus tenuibus subulatisque.

Distr. Ab.: Vidskär in Korpo (F. Elfving). N.: Långskär ad Tvärminne (K. Linkola), Mjölö (Vain.).

Podetia sterilia crass. 0.5—0.7 (—1) mm.

Var. *muricata* (Del.) Arn.

Lich. Fränk. Jur. (Fl. 1884) p. 24; Vain. l. c. I p. 169, II p. 452, III p. 236. *Cenomyce muricata* Del. in Dub. Bot. Gall. (1830) p. 622 (Vain. l. c. I p. 371).

Exs. Rabenh. Clad. Eur. (1860) tab. XXXII n. xxxiii 7, tab. XXXIV n. 17. — Zwackh Lich. Exs. (1881) n. 642 A, B. — Malme Lich. Suec. Exs. XXII (1915) n. 528.

Podetia sat crassa, esorediosa, squamis destituta, apicibus obtusiusculis.

Distr. Supra rupes littorales in Mjölö prope Helsingforsiam (Vain.).

Podetia circ. 1.5—2 (—1) mm crassa, apicem versus interdum fuscescentia.

Var. *Euganea* (Mass.) Arn.

Vain. l. c. III p. 236. *Cl. rangiformis* v. *muricata* b) *Euganea* Arn. Lich. Fränk. Jur. (Fl. 1885) p. 24; Vain. l. c. I p. 372, II p. 452. *Cl. muricata* var. *euganea* Mass. Sched. Crit. (1855) p. 115, Lich. Ital. Exs. VI (1856) n. 191.

Podetia sat crassa, esorediosa, squamosa, apicibus obtusiusculis.

Distr. Supra rupes littorales in Mjölö prope Helsingforsiam (Vain.).

Podetia 1.5—2 mm crassa, cinereo- vel albido-glauescentia aut partim testacea. Conidangia subcylindrica, basi haud constricta.

17. *Cl. crispata* (Ach.) Flot.

Merkw. Flecht. Hirschb. (1839) p. 4; Vain. l. c. I p. 377, II p. 453, III p. 241. — *Baeomyces turbinatus* ζ. *B. crispatus* Ach. Meth. Lich. (1803) p. 341 p. maj. p.

Thallus primarius persistens aut demum evanescens, laciniis sat brevibus, vulgo subcuneatis. *Podetia* tubaeformia aut inaequaliter subcylindrica, scyphifera aut axillis aliquantum dilatatis, scyphis axillisve perviis, vulgo radiatoramosa proliferave, corticata, sublaevigata, esorediosa, squamis destituta aut squamosa, impellucida, glaucescentia aut subfusca, KHO non reagentia. Conidangia subcylindrica,

basi vulgo non constricta, vulgo materiam dilute coccineam continentia.

Distr. Ad truncos putridos et terram humosam muscosve supra saxa et rupes et ad terram arenosam et ipsa saxa locis umbrosis silvarum et locis apricis crescens, sat frequenter toto territorio provenit.

Thallus primarius squamis circ. 1—4 mm longis, circ. 0.280—0.125 mm crassis, digitato-laciniatis crenatisque, laciniis vulgo subcuneatis, circ. 0.5 mm latis, raro latoribus, KHO non reagens, esorediatus. Podetia e superficie thalli primarii enata, basi persistentia aut demum emorientia, apice haud diu aut diu accrescentia, parietibus circ. 0.160—0.280 mm crassis, acidum squamaticum circ. 1—1.5 $\frac{0}{0}$ continentia (sec. Zopf in Liebig's Ann. 352 p. 39, Flechtenst. p. 260, Beitr. Chem. Mon. Clad. p. 92, 93). Stratum corticale et medullare exterius podetiorum bene evoluta. Stratum chondroideum circ. 0.100—0.030 mm crassum, sine limite distincto in stratum medullare exterius transiens. Apothecia lat. circiter 0.5—0.7 mm, in apicibus ramulorum brevium vel brevissimorum radiatim aut subcorymbose dispositum parcius aggregata aut subsolitaria, primum tenuissime marginata, plana aut demum convexa, peltata, fusca aut rarius testacea. Sporae fusiformes, long. 0.014—0.009, crass. 0.003—0.002 mm. Conidangia circ. 0.300—0.160 mm crassa, vulgo cylindrica aut ovoideo-cylindrica, rarius obovoideo-cylindrica aut fere capituliformia, basi non aut levissime constricta, nigricantia aut fusconigra. Conidia subcylindrica, curvata aut leviter curvata, long. 0.005—0.008, crass. 0.0005 mm.

Var. *infundibulifera* (Schaer.) Vain.

l. c. I p. 382, 384, II p. 453, III p. 241. *Cl. ceranoides infundibulifera simpliciuscula* Schaer. Enum. Lich. Eur. (1850) p. 197.

Exs. Fr. Lich. Suec. Exs. II (1818) n. 56 p. p. — Schaer. Lich. Helv. Exs. XI (1836) n. 275. — Tuck. Lich. Am. Exs. (1847) n. 31. — Hepp Flecht. Eur. II (1857) n. 295 p. p. — Mudd Mon. Brit. Clad. (1865) n. 45. — Rabenh. Clad. Eur. (1860) tab. XIX n. xxv 1. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 77 a—c, cont. (1921) n. 667. — Arn. Lich. Exs. (1884) n. 695 a, c, d, p. p., (1888) n. 1358. — Rehm Clad. Exs. (1886) n. 296, (1895) n. 438. — Zwackh Lich. Exs. (1888) n. 1017, 1019, (1889) n. 1070.

Podetia basi vulgo subpersistentia, vulgo crassa aut crassiuscula, scyphis sat latis, hiantibus, apicibus sterilibus scyphiferis, squamis fere destituta, lateribus subintegris.

Distr. Forma typica in Lapponia passim collecta, ceterum toto territorio sat frequenter proveniens.

Podetia apice raro diutius accrescentia, long. circ. 15—80, crass. circ. 0.7—3 mm, scyphis circ. 3—6 mm latis, demum pluries repetitoprolifera, scyphis regularibus aut corymbo irregulari apotheciorum terminata, colore variabilia.

Obs. *F. schistopoda* Vain. l. c. I p. 383, III p. 241. Podetia latere fere toto fissa, scyphifera, scyphis p. p. fissis, margine pluries proliferis, glaucescenti-albido- et fusciscenti-variegata. Est deflexus accidentalis hujus varietatis. Supra muscos in saxo ad Haukkavuori prope Jyväskylä in Tb. (Vain.).

Var. *divulsa* (Del.) Arn.

Lich. Tirol XXI (1880) p. 115 (23); Vain. l. c. I p. 385, 386, II p. 454, III p. 241. *Cenomyce divulsa* Del. in Dub. Bot. Gall. (1830) p. 125. *Cl. furcata* α. *crispata* α 2. *blastica* ***polyphylla* Flot. Lich. Fl. Siles. (1849) p. 41, Deutsch. Lich. n. 82 B (icon.: Arn. Lich. Exs., 1879, n. 1461 B, 1462 D b, c).

Exs. Rehm Clad. Exs. (1885) n. 256, 257, (1886) n. 295, 297, 298, (1893) n. 431. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 672.

Podetia basi vulgo subpersistentia, vulgo crassa aut crassiuscula, scyphis sat latis, hiantibus, tota aut margine scyphorum squamosa.

Distr. In Lapponia paucis locis collecta, in provinciis magis meridionalibus non est rara.

Podetia apice raro diutius accrescentia, long. circ. 15—80 mm, crass. circ. 0.7—3 mm, scyphis circ. 2—6 mm latis, obliquis aut fere regularibus, apicem versus saepe obsoletis et corymboso-laceratis aut radiatis, demum pluries repetitoprolifera, squamis vulgo anguste laciniatis crenatisque, glaucescenti-albida aut olivaceo- vel testaceo-variegata.

Var. *dilacerata* (Schaer.) Malbr.

Suppl. Lich. Norm. (1881) p. 14; Vain. l. c. I p. 388, 389, II p. 453, III p. 241. *Cl. ceranoides prolifera dilacerata* Schaer. Enum. Lich. Eur. (1850) p. 198. *Cl. furcata* α. *crispata* α 2. *blastica* ****heterodactyla glabra* Flot. Lich. Fl. Siles. (1849) p. 41 (icon.: Arn. Lich. Exs., 1889, n. 1461 C).

Exs. Mudd Mon. Brit. Clad. (1865) n. 38. — Arn. Lich. Exs. (1876) n. 695 c, (1884) n. 695 d. — Rehm Clad. Exs. (1886) n. 298, (1895) n. 436.

Podetia crassa aut crassiuscula, irregulariter turgescientia, ascypha, apicibus varie lacerato-ramulosis, squamis fere destituta.

Distr. Haud rara toto territorio, locis numerosis etiam in Lapponia collecta.

Thallus primarius sat diu persistens aut demum evanescens. Podetia basi subpersistencia aut demum emorientia, apice haud diu aut sat diu accrescentia, circiter 30—120 mm longa, 1—4 mm crassa, irregulariter subdichotome aut sympodialiter aut radiatim vel fasciculatim ramosa, apicibus varie lacerato-ramulosis, vulgo glaucescentia aut olivaceo-variegata.

Var. *elegans* (Del.) Vain.

l. c. I p. 390, III p. 241. *Cl. turgida* β . *elegans* Del. in Schaer. Enum. Lich. Eur. (1850) p. 201.

Exs. Rehm Clad. Exs. (1883) n. 220 p. maj. p. (p. p. *Cl. squamosa*), (1885) n. 254, (1886) n. 295. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 673.

Podetia crassa aut crassiuscula, irregulariter turgescientia, ascypha, apicibus varie lacerato-ramulosis, squamosa squamulosave.

Distr. Non sit rara, sed tantum paucis locis collecta.

Podetiorum statura similis v. *dilaceratae*, a qua tantum podetiis squamosis differt.

Var. *virgata* (Ach.) Vain.

Adj. Lich. Lapp. I (1881) p. 111, Mon. Clad. Univ. p. 391, III p. 241. *Genomyce gonorega* \pm . *C. virgata* Ach. Lich. Univ. (1810) p. 553 (p. p.).

Exs. Hepp Flecht. Eur. II (1857) n. 296. — Arn. Lich. Exs. (1884) n. 1024 p. min. p. — Rehm Clad. Exs. (1890) n. 390, 391 (in nonnull. specim.), 393. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 674 (in v. *dilaceratam* accedens).

Podetia basi emorientia et apice sat diu accrescentia, sat tenuia, scyphis angustis, apertis, proliferationibus radiisque vulgo sat numerosis, apicibus scyphiferis (saepe minute), squamis destituta, vulgo testacea.

Distr. Locis numerosis collecta in Lapponia, ceterum rara. KLad.: Remtjinhorfi in Soanlahti (G. Lång). Ta.: Uusikartano in Hollola (atypica collecta ab J. P. Norrlin).

Podetia long. circ. 30—80 mm, crass. 0.5—1 mm, scyphis angustis, 1.5—3 mm latis, brevibus, sat abrupte dilatatis, sat regularibus, margine radiato, radiis saepius 2—pluribus accrescentibus, ceteris plus minus abbreviatis, pluries repetito-prolifera, tabulatis usque ad 8, ramis superioribus tenuissimis et saepe minute scyphiferis scyphisque

subulato- aut spinulato-radiatis, dense constipata, esquamulosa (aut squamosa in f. *Kairamoi*, ad Liehkvär in LIm. collecta ab A. O. Kairamo). Conidangia materiam sat intense coccineam continentia.

Obs. *F. parvula* Vain., l. c. I p. 392, III p. 241 (Adj. Lich. Lapp. I, 1881, p. 111), thallo primario persistente, podetiis brevibus, long. 15—10, crass. 0.4—0.7 mm, esquamulosis, fusciscentibus aut testaceo-pallidis, scyphis sat parvis, 1.5—2 mm latis, margine radiato-proliferis, tabulatis duobus instructa (videas l. c. III p. 108), supra muscos in saxis locis apricis ad Louhivaara in par. Kianta (Vain.) collecta est. — *F. leucosperma* Vain., l. c. I p. 392, III p. 241, conidangiis haud materiam coccineam continentibus, in reg. betulina montis Leutsuvaara in LENont. (J. P. Norrlin) lectum est. Podetia glaucescenti-albida, long. 70—25, crass. 1.5—0.5 mm, statura sicut in v. *virgata*.

Var. *cetrariaeformis* (Del.) Vain.

l. c. I p. 392, 394, II p. 454, III p. 242. *Cenomyce gracilis* o. *cetrariaeformis* Del. in Dub. Bot. Gall. (1830) p. 625. *Cl. degenerans* **Cl. trachyna* f. *trachynella* Nyl. in Norrl. Ber. Torn. Lappm. (1873) p. 320.

Exs. Desmaz. Crypt. Fr. (1863) n. 8 (in mus. Paris.). — Fellm. Lich. Arct. (1864) n. 33 (sec. Coem. l. c. n. 200). — Coem. Clad. Belg. II (1866) n. 200 (specim. dextr.). — Arn. Lich. Exs. (1888) n. 1374 a (2 specim. dextr.). — Zahlbr. Krypt. Exs. Vindob. XXI (1913) n. 2163 a, b. — Malme Lich. Suec. Exs. XIX (1915) n. 451.

Podetia vulgo haud diu accrescentia, sat tenuia, scyphis angustis, demum in latere podetii sitis, apertis, proliferationibus sub-solitariis, tabulatis vulgo haud numerosis, apicibus minute scyphiferis aut obtusiusculis spinulosisque, squamis fere destituta, spadicea aut testacea.

Distr. LENont.: Supra muscos destructos in rupe prope Kaaresuanto (J. P. Norrlin). In territorio Suecico in reg. sylv. prope Luongasjoki in par. Kaaresuanto (G. Lång in Zahlbr. l. c. n. 2163 a).

Intermedia est inter var. *gracilescentem* et *Cl. Delessertii*, in priorem transiens. Thallus primarius persistens aut demum evanes-cens. Podetia basi persistentia aut demum emorientia, apice haud diu accrescentia aut in speciminibus minus typicis diu accrescentia, long. 25—80 mm, crass. 0.5—1 mm, scyphis distinctis, 1.5—2 mm latis, irregularibus obliquisque, breviter radiatis aut spinuloso-dentatis, cortice typice subcontinuo, basi vulgo pallida aut glaucescenti-pallida. Apothecia in corymbis parvis terminalibus aut radiis scyphorum affixa. Conidangia subcylindrica aut ovoideo-conoidea, raro fere capituli-formia, basi haud aut rarius levissime constricta, materiam coccineam continentia. Ad Voroninsk in Lapponia Murmanica ab A. O. Kairamo

specimen (130), in *Cl. Delessertii* forsan transiens, lectum, podetiis 100 mm longis, 1—0.4 mm crassis, crebre constipatis, basi longe emorientibus albido-maculatisque, apice fuscescentibus, passim minute obsoleteve scyphiferis.

Var. *gracilescens* (Rabenh.) Vain.

l. c. I p. 395, II p. 454, III p. 242; Aigret Mon. Clad. Belg. (1903) p. 125 (Bull. Soc. R. Bot. Belg. XL); Sandst. Clad. Nordw. Tiefl. (1906) p. 418, II p. (1912) p. 362; Zopf Beitr. Chem. Mon. Clad. (1908) p. 93. *Cl. rangiformis* f. *gracilescens* Rabenh. Clad. Eur. Supl. (1863) tab. XXXIV n. 22 (in mus. Fenn.).

Exs. Rabenh. l. c. n. 22 et 23. — Rehm Clad. Exs. (1883) n. 197, (1887) n. 332. — Zwackh Lich. Exs. (1886) n. 995, (1889) n. 1071, 1072 A, B, C. — Arn. Lich. Exs. (1886) n. 1147 a, b, (1888) 1364 a (sin.), b (specim. inf.). — Zahlbr. Krypt. Exs. Vindob. XIV (1906) n. 1362.

Icon. Arn. Lich. Exs. (1888) n. 1283.

Podetia basi emorientia et apice sat diu accrescentia, tenuia, scyphis angustissimis aut fere obsoletis, apertis, apicibus ascyphis spinulosisque, squamis destituta, subglaucescentia.

Distr. Ad Evo in Ta. (J. P. Norrlin).

18. *Cl. Delessertii* (Nyl.) Vain.

l. c. I p. 397, 400, II p. 455, III p. 242, Lich. Exp. Vegae Pittekai Sibir. (1909) p. 100; Hue Lich. Extra-Eur. (1901) p. 56 n. 94; Aigret Mon. Clad. Belg. (1903) p. 126; Sandst. Clad. Nordw. Tiefl. (1906) p. 420 p. p.; Harm. Lich. Fr. (1907) p. 259; Malme Sv. Bot. Tidskr. 1916 p. 85. *Cenomyce Delessertii* Del. in Nyl. Syn. Lich. (1860) p. 208. *Cl. degenerans* **Cl. trachyna* f. *subfurcata* Nyl. in Norrl. Ber. Torn. Lappm. (1873) p. 320. *Cl. crispata* **Cl. subfurcata* Vain. Adj. Lich. Lapp. I (1881) p. 112.

Exs. Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 438. — Arn. Lich. Exs. (1888) n. 1364 b (specim. super.). — Havaas Lich. Exs. Norv. (1903) n. 246.

Thallus primarius demum evanescens. Podetia longa, sterilia apice diu accrescentia, crassiuscula aut sat tenuia, inaequaliter subcylindrica, ascypha, sympodialiter crebre ramosa aut raro increbre dichotome ramosa, axillis hiantibus perviisve, esorediosa, corticata, laevigata aut subrugulosa, vulgo squamis fere destituta, impellucida, fuscescentia aut olivaceo-glaucescentia, KHO non reagentia, basi emori-ente vulgo maculata, strato chondroideo sat tenui, indistincte

limitato. Conidangia subcylindrica, basi vix constricta, materiam coccineam continentia.

Distr. Supra ipsam rupem et ad muscos et terram humosam supra saxa et rupes, praesertim locis apricis humidiusculis crescens, haud rara in Lapponia Inarensi (velut ad Veskonieni, Ruoptuinvaara, Paatsjoki, cet., conf. Vain. Adj. Lich. Lapp. I p. 112). Ad hanc speciem spectant indicationes de „*Cl. crispata* f. *cetrariaeformi*“ in Kihlm. Neue Beitr. Flecht. Kola p. 46: „In steinigem, im Vorsommer zeitweise überschwemmten oder theilweise versumpften Niederungen häufig und oft reichlich (Voronisk, Orlov, etc.)“. Etiam ad Lovosersk in LIm. (A. O. Kairamo) et ad Olenji in LMur. (N. I. Fellman, „*Cl. degenerans* f. *fuscescens* Nyl.“ p. p.). In reg. betulina ad Kögäs prope Mare Glaciale (Vain.). LKem.: Muonio, Kätkesuanto et prope Lompolutunturi locis uliginosis (Norrl. l. c.), loco udo in turfosis apricis in Kotivuoma in Kittilä (G. Lång), Pyhäntunturi (Vain.). Kuus.: In monte Nuorunen (Vain.). KKER.: Päänuorunen (Vain.). OKaj.: Suomula in Kianta. Tb.: Pihlajavesi (Norrl.). Kb.: Louhivaara (H. L. F. n. 438) et ad Kynsisaari in Nurmes (Vain.). Ta.: Korpilahti (Norrl.). KOL.: Ahvenlampi ad Käsnäselkä in Salmi (K. Linkola). Ab.: Pyhänsuu in Pargas (K. Linkola). N.: Anttila ad Niemi in Orimattila (K. Linkola), Meilans ad Helsingforsiam (Vain.).

Bona est species, quamquam interdum defecte evoluta ad *Cl. crispatam* v. *gracilentem* et var. *cetrariaeformem* proxime accedens. Talia specimina difficile determinabilia, sed ad *Cl. Delessertii* pertinentia, sunt Zwackh Lich. Exs. n. 1073 A, B, 1074, 1075. — Thallus primarius squamis 1—5 mm longis, 0.2—0.25 mm crassis, irregulariter lobato-crenatis laciniatisve. Podetia e superficie thalli primarii enata, long. circ. 50—110 (—15) mm, crass. circ. 1—1.5 (0.7—2.5) mm, vulgo crebre constipata erectaque, parietibus circ. 0.120—0.230 mm crassis. Stratum medullare exterius bene evolutum. Stratum chondroideum ex eo haud bene limitatum et ei immixtum, distinctius solum 0.030—0.060 mm crassum. Apothecia lat. circ. 0.5—0.7 mm, in apicibus ramulorum brevium, circ. 1—2 mm longorum, circa foramina axillaria obliqua subradiatim dispositorum et racemos irregulares formantium, subsolitaria aut parcius aggregata, saltem

primo tenuissime marginata, plana aut demum convexiuscula convexave, fusca aut fusconigra, peltata, ambitu haud deflexo. Conidangia circ. 0.280—0.150 mm crassa, conoideo-cylindrica aut dolioliformia aut subcylindrica, basi non aut levissime constricta, materiam coccineam sat abundanter continentia.

F. subchordalis Vain., l. c. I p. 401, III p. 242, podetiis circ. 1 mm crassis, parce dichotome neque sympodialiter ramosis, basin versus aut usque ad medium squamosis, haud maculatis, instructa, ab Arn. in Tirolia collecta est. Huic proximus est Rehm Clad. Exs. (1879) n. 144 et (1885) n. 263, qui posterior autem podetiis instructus est partim sympodialiter ramosis et partim minute squamulosis, sicut f. **trachytera** Vain., quae ceterum subsimilis est f. *subchordali* et ad Pahtavaara in LENont. collecta est („*Cl. degenerans* **Cl. trachyna*“ sec. determ. Nyl. in Norrl. Ber. Torn. Lappm. p. 319).

F. tenuior Vain., podetiis 0.4—0.5 mm crassis, in basi late emoriente etiam 1 mm crassis, maculatis, sat increbre dichotome et sympodialiter ramosis, crebre constipatis. In turfosis apricis in par. Kittilä in LKem. (G. Lång).

19. *Cl. squamosa* (Scop.) Hoffm.

Deutschl. Fl. II (1796) p. 125; Vain. l. c. I p. 411, 419, II p. 456, III p. 242. *Lichen squamosus* Scop. Fl. Carn. II ed. 2 (1772) p. 368 p. min. p.

Exs. Fellm. Lich. Arct. (1864) n. 34. — Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 439, cont. (1921) n. 649—665.

Thallus primarius persistens aut demum evanescens, laciniis vulgo brevibus subcuneatisque. Podetia sat brevia aut longa, raro brevia, sat crassa aut sat tenuia, tubaeformia aut subcylindrica, vulgo scyphifera, raro ascypha, axillis scyphisque perviis, granulosa aut esorediosa, decorticata aut cortice verruculoso vel areolato, partim disperso, vulgo squamulosa, saepe etiam squamosa, impellucida, albida aut glaucescentia aut rarius fuscescentia, KHO non reagentia. Conidangia subcylindrica, nucleo dilutissime coccineo aut albido.

Distr. Ad terram humosam et muscos destructos supra saxa et rupes, rarius ad truncos putridos et terram arenosam, locis subumbrosis subhumidisve aut apricis siccisve crescens, in maxima parte territorii est frequens, in Lapponia paucis locis visa. LENont.: Leutsuvaara meridiem versus a

Kilpisjärvi (J. P. Norrlin). LIn.: Reg. subalp. montium Hammastunturit (Vain.). LIm.: Kantalahti (G. Selin). LPon.: Svjetoinos (N. I. Fellman), promontorium Orlov (A. O. Kairamo, „f. interveniens Nyl.“ et „Cl. degen. f. haplotea“ sec. Nyl.). Ob.: Kallinkangas in Kemi (V. Räsänen), Simo (Räs.). Kuus.: Reg. abiet. montis Näränkävaara (Vain.). KKER.: Reg. subalp. montis Kivakka (Vain. Adj. Lich. Lapp. I p. 113).

Thallus primarius squamis mediocribus aut raro magnis, long. circ. 2—7 (—10) mm, crass. 0.320—0.160 mm, laciniis circ. 0.5—1 mm latis, esorediosis aut interdum subtus parce granulosis. Podetia e superficie thalli primarii enata, apice haud diu accrescentia, long. circ. 10—90 (raro —2) mm, crass. 0.5—2.5 (—5) mm, apicibus scyphiferis aut obtusis aut raro subulatis, aggregata caespitosave aut raro constipata, esorediosa aut granulosa, granulis 0.040—0.025 mm crassis, raro passim etiam farinososorediosa, tota decorticata aut cortice verruculoso aut maculas areolasve dispersas formante aut basin versus subcontinuo, raro squamis squamulisve destituta, partibus emorientibus fuscescentibus nigricantibusve, rarius maculatis, parietibus circ. 0.350—0.160 (partibus decorticatis —0.090) mm crassis, sec. Hesse (Journ. Prakt. Chem. 62 p. 450) et Zopf (Flechtenst. p. 260, 408, Chem. Mon. Clad. p. 91) acidum squamaticum continentia (huic acido reactiones sequentes a Zopf indicantur: „Die alkoholische Lösung wird durch Eisenchloridspuren purpurn“, „wird die Säure mit verdünnter Kalilauge gekocht, so entsteht eine rothe bis rothbraune Lösung, die nach Zusatz eines Tropfens Chloroform sehr deutlich grün fluoresziert“). Stratum chondroideum podetiorum inaequaliter incrassatum, circ. 0.020—0.150 mm crassum, sine limite distincto in stratum medullare exterius transiens. Apothecia lat. 0.5—0.7 mm, in margine scyphorum aut in apicibus ramulorum brevium aut brevissimorum subradiatim aut irregulariter dispositorum parcius aggregata aut subsolitaria, plana aut demum convexa, peltata, fusca (aut humida vulgo livido-fuscescentia), rarius pallida, raro albida. Sporae fusiformes oblongaeve aut ovoideae, long. 0.014—0.008, crass. 0.0035—0.0025 mm. Conidangia circ. 0.140—0.230 mm crassa, vulgo cylindrica aut rarius ovoideo- aut obovoideo- vel capitato-subcylindrica, basi non aut vix contracta, nigra aut fusca. Conidia subcylindrica, leviter aut parcius bene curvata, long. 0.008—0.006, crass. vix 0.001 mm.

F. denticollis (Hoffm.) Floerk.

Beisp. Unnat. Trenn., 1809, p. 101; Vain. l. c. I p. 421, 423, III p. 242. *Cl. denticollis* Hoffm. Deutschl. Fl. II (1796) p. 125.

Exs. Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 439, cont. (1921) n. 649—651. — Zwackh Lich. Exs. (1885) n. 887, (1894) n. 1155, 1156.

Podetia scyphifera, fere decorticata, haud aut parce granulosa, plus minus squamulosa, parce squamosa aut squamis majoribus destituta.

Distr. Frequens in maxima parte territorii, in regionibus septentrionalibus rara. Lapponia: Hammastunturit (Vain.), Svjetoinos (N. I. Fellman).

F. squamosissima Floerk.

Clad. Comm. (1828) p. 132 (icon. in Arn. Lich. Exs., 1890, n. 1490); Vain. l. c. II p. 456, III p. 242 (I p. 421, 424).

Exs. Malme Lich. Suec. Exs. XIX (1915) n. 452.

Podetia scyphifera, fere decorticata, parce granulosa verruculosa-que, crebre squamosa et saepe etiam squamulosa.

Distr. Haud rara in prov. meridionalibus.

F. muricella (Del.) Vain.

l. c. I p. 431, 434, II p. 456, III p. 243. *Cenomyce squamosa* v. *muricella* Del. in Dub. Bot. Gall. (1830) p. 434.

Exs. Rehm Clad. Exs. (1888) n. 348—352. — Zwackh Lich. Exs. (1888) n. 1025, (1889) n. 1076 p. p. — Havaas Lich. Exs. Norv. (1902) n. 93. — Norrl. et Nyl. Herb. Lich. Fenn. (1921) n. 660, 661, 663.

Podetia ascypha, inaequaliter attenuata obtusave, vulgo fere decorticata, haud aut parce granulosa, plus minus squamulosa, parce aut bene squamosa.

Distr. Locis numerosis in prov. meridionalibus et mediis. Lapponia: Leutsuvaara („Cl. degenerans f. pleolepidea“ sec. determ. Nyl. in Norrl. Ber. Torn. Lappm. p. 319), Orlov („Cl. subfurcata f. interveniens“ Nyl. in Kihlm. Neu. Beitr. Flecht. Kola p. 46), Kantalhti (G. Selin), Kemi (V. Räsänen).

F. multibrachiata Floerk.

Vain. l. c. I p. 437, 439, II p. 457, III p. 243. *Cl. squamosa* β. *asperella* d. *multibrachiata* Floerk. Clad. Comm. (1828) p. 133. *Cl. squamosa* f. *pseudocrispata* Sandst. Clad. Nordw. Tiefl. (1906) p. 423, tab. XXIII p. p. (Zopf Beitr. Chem. Mon. Clad., 1908, p. 92).

Exs. Zwackh Lich. Exs. (1859) n. 379, (1884) n. 888 (in f. *subtrachynellam* transiens), (1886) n. 888 B, (1884) n. 927 (p. p. *Cl. crispata*), (1886) n. 958 p. maj. p., (1888) n. 1013, 1016, 1018, (1889) n. 1068 A, B, C (in f. *turfaceam* transiens), (1891) n. 1138, 1141, (1894) n. 1149—1154. — Rabenh. Clad. Eur. (1860) tab. XXVI n. 15, 16, Clad. Eur. Supl. (1863) tab. XXVII n. 31. — Arn. Lich. Exs. (1883) n. 978, (1888) n. 1358, (1892) n. 1542. — Rehm Clad. Exs. (1887) n. 321 p. p., (1889) n. 355, 356. — Zahlbr. Krypt. Exs. XVI (1907) n. 1540. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 658 (in f. *subtrachynellam* accedens).

Icon. Arn. Lich. Exs. (1888) n. 1275. — Sandst. Clad. Nordw. Tiefl. (1906) tab. XXIII 7, 8, 9, 10, XXIV 1, 2, 3.

Podetia scyphifera, cortice partim subcontinuo aut areolas parvulas dispersas formante instructa, haud raro parce granulosa, squamis squamulisque fere destituta, vulgo glaucescentia, rarius subtestacea aut cinereo-fuscescentia.

Distr. Ad terram turfosam et muscos destructos in sphagnetis turfosis non sit rara in prov. merid. et mediis, sed tantum paucis locis collecta. Inter muscos in rupe montis Näränkäväära in reg. abietina paroeciae Kuusamo (Vain.). In sphagneto turfoso prope Templum in Kuhmo in OKaj. (Vain.). In turfoso ad Huhtaneva in Lapua in Oa. (V. Räsänen). Selkiinsuo in Pieksämäki in Sb. (J. P. Norrlin l. c.). Savonlinna in Sa. (O. Carlenius). Abundanter in sphagneto turfoso in Laaso prope Hersala in Hollola in Ta. (Vain.). Ad terram humosam in Meilans prope Helsingforsiam (Vain.).

Obs. „*Cl. squamosa* **fascicularis* (Del.) Nyl.“ in Zwackh Lich. Exs. (1889) n. „1068, 1069, (1891) n. 1109, 1110, 1111“ (sec. sched. ed. 2 in n. 1069), (1894) n. 1151—1154 p. p. huc pertinet. *Cen. fascicularis* Del. sec. specim. authent. in herb. Nyl. (n. 38341) p. min. p. ad f. *multibrachiatam* pertinet, ceterum ad f. *denticollem* (conf. Vain. l. c. I p. 386).

F. *subtrachynella* Vain.

l. c. III p. 243 (I p. 440, II p. 458); Sandst. Clad. Nordw. Tiefl. (1906) p. 426, tab. XXIV f. 4 (sec. Sandst.). *Cl. crispata* var. *subtrachynella* Vain. Adj. Lich. Lapp. I (1881) n. 111, 113.

Exs. Rehm Clad. Exs. (1879) n. 139 p. p., 142, (1887) n. 324 (colore in f. *multibrachiatam* acced.), (1889) n. 375 p. maj. p. — Zwackh Lich. Exs. (1888) n. 1014 p. p., 1015 (p. p.), (1889) n. 1069 p. p., (1891) n. 1110 p. p. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 659 (in f. *multibrachiatam* transiens).

Podetia scyphifera, cortice bene evoluto, areolas parvulas dispersas formante aut partim subcontinuo instructa, rarius parce subgranulosa, passim praesertimque apice e squamulis minutissimis furfuraceo-scabrida, squamis destituta aut basi parce squamosa, vulgo testaceo-pallida aut cinereo-fuscescentia, rarius cinereo-glaucescentia.

Distr. Ad terram turfosam et muscos destructos in sphagnetis turfosis una cum f. *multibrachiata* et f. *turfacea*, in quas transit. Kb.: Prope Vieki in par. Lieksa (Vain.). Sb.: Selkiinsuo in Pieksämäki (J. P. Norrlin). Ta.: Laaso prope Hersala in Hollola abundanter (Vain.).

F. *turfacea* (Arn.) Vain.

Mon. Clad. Univ. III (1897) p. 243 (I p. 438, 440, II p. 458); Sandst. Clad. Nordw. Tiefl. (1906) p. 426, tab. XXIV f. 6, II (1912) p. 363; Zopf Beitr. Chem. Mon. Clad. (1908) p. 92. *Cl. trachyna* f. *turfacea* Arn. in Rehm Clad. Exs. III (1879) n. 139 p. p., 140, 141, 142 p. p.

Exs. Rehm Clad. Exs. (1879) n. 139 p. p., 140, 141, 142 p. p., 143, (1886) n. 313, (1887) n. 322, 323 p. p., (1889) n. 375 p. min. p., (1892) n. 408, 409. — Zwackh Lich. Exs. (1884) n. 928, (1886) n. 959 p. maj. p., (1888) n. 1014 (in f. *subtrachynellam* transiens), 1015 (sicut praecedens), 1023, 1024, 1026, (1889) n. 1067, (1891) n. 1108, 1109, 1110 p. p. — Zahlbr. Krypt. Exs. Vindob. XVI (1907) n. 1539 p. p. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 664, 665.

Podetia ascypha aut parce obsoleteve scyphifera, cortice bene evoluto, areolas parvulas dispersas formante aut partim subcontinuo instructa, granulis destituta, squamosa, squamis medioeribus minori-busve, praesertim partibus decorticatis fusciscentibus.

Distr. Ad terram turfosam et muscos destructos in sphagnetis turfosis non sit rara in prov. meridionalibus. Ab.: Karuna (F. Elfving). N.: Prope Castrum Aquaeductus Helsingforsiae (Norrl. et Nyl. Herb. Lich. Fenn. cont. n. 656 p. p.), supra muscos loco irrigato in rupe. Ta.: Abundanter in Laaso prope Hersala in Hollola (Vain., Norrl.), Vahtervehmais in Evo (G. Lång). KLad.: Sammallampi in Ruskeala (Hj. Hjelt et V. F. Brotherus). Ob.: Huhtaneva in Lapua (V. Räsänen). Sb.: Ryömä prope Kuopio (K. Linkola).

Obs. F. *mucronata* Vain. (l. c. I p. 438, III p. 243), podetiis ascyphis, haud granulosis, fere esquamosis, glaucescentibus, cortice areolato instructis, in Välikallio Hoglandiae collecta est (M. Brenner). — F. *pityrea* Arn. (Lich. Fränk. Jur., Fl. 1884, p. 84, Vain. l. c. I p. 441, II p. 458, III p. 243), podetiis brevibus, circ. 5—10 mm longis, obsolete scyphiferis, areolato-corticatis, haud granulosis, sat parce squamulosis aut esquamulosis, thallo primario demum evanescente, squamis parvis. Specimen podetiis fusciscentibus instructum prope Castrum Aquaeductus Helsingforsiae a Norrl. collectum est. In specim. orig. podetia sunt glaucescentia. — F. *polychonia* Floerk. (Clad. Comm., 1828, p. 136, Vain. l. c. I p. 442, II p. 458, III p. 243), podetiis parte superiore decorticata sat crebre granulosa et esquamulosa, cum *Cl. cenotea* facile commixta, in Fennia nondum collecta est.

F. *phyllopoda* Vain.

l. c. I p. 441, III p. 243; Aigret Mon. Clad. Belg. (1903) p. 131.

Thallus primarius persistens, squamis magnis, long. 5—3 mm, demum saepe firmis latisque (2—3 mm latis), ex apice in podetia continuatis. Podetia long. circ. 2—8 mm, difformia, ascypha aut obsolete scyphifera, irregulariter ramosa aut radiata, cortice areolato, haud granulosa, squamis destituta aut bene squamosa squamulosave, olivaceo-fuscescentia aut glaucescentia albidave.

Distr. Supra muscos rupium in Mäkiinpäällys Hoglandiae (Vain.) et ad terram arenosam in rupe prope Castrum Aquaeductus Helsingforsiae (J. P. Norrlin).

F. *phyllocoma* Rabenh.

Vain. l. c. I p. 441, II p. 458, III p. 243. *Cl. squamosa* δ . *macrophylla* D. (*phyllocoma*) Rabenh. Clad. Eur. (1860) tab. XXVI n. 20.

Exs. Rabenh. Clad. Eur. (1860) tab. XXVI n. 20, XXVII n. 21, 22. — Rehm Clad. Exs. (1883) n. 207—209, 218, 221, (1886) n. 289 (in f. *denticollem* transiens), (1892) n. 422 (acced. ad f. *squamosissimam*). — Zwackh Lich. Exs. (1888) n. 1020, 1021, (1891) n. 1106 (atypica). — Zahlbr. Krypt. Exs. Vindob. XVI (1907) n. 1537. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 654, 655, 656 (interm. inter f. *phyllocomam* et f. *turfaceam*), 657.

Icon. Arn. Lich. Exs. (1888) n. 1325.

Podetia scyphifera, cortice areolato aut partim subcontinuo aut apicem versus verruculoso, nec granulosa, nec furfuracea, squamis majusculis instructa, albido-glaucescentia aut rarius cinereo-fuscescenti-variegata.

Distr. Supra muscos in rupibus non sit rara in prov. meridionalibus et mediis, locis numerosis collecta.

Cl. subsquamosa (Nyl.) Vain.

l. c. I p. 445, II p. 459, III p. 238; Hue Lich. Extr.-Eur. (1898) p. 58 n. 97; Aigret Mon. Clad. Belg. (1903) p. 133; Harm. Lich. Franc. III (1907) p. 264. *Cl. delicata* var. *subsquamosa* Nyl. Fl. 1866 p. 421.

Exs. Havaas Lich. Exs. Norv. (1908) n. 427.

Podetia longa — sat brevia, scyphifera aut ascypha, scyphis axillisque perviis, plus minus granulosa, fere decorticata aut cortice verruculoso areolato, squamosa squamulosave aut squamis squamulisque destituta, impellucida, albida aut cinereo-fuscescentia, KHO intense lutescentia, verisim. acidum thamnolicum continentia. Conidangia materiam coccineam non continentia.

Distr. In Fennia nondum collecta est, in Norvegia (ad Mosterhavn et alibi sec. Lynge Stud. Lich. Norw. p. 54) et pluribus aliis locis in Europa proveniens. — *Cl. Santensis* Tuck. (Suppl. En. North Am. Lich., 1858, p. 427), sec. specim. orig. malum in herb. Nyl. KHO lutescens, proxima est *Cl. subsquamosae*, podetiis haud distincte granulosus ab ea differens, et forsitan autonoma species.

20. *Cl. delicata* (Ehrh.) Floerk.

Clad. Comm. (1828) p. 7; Vain. l. c. I p. 465, II p. 461, III p. 238. *Lichen delicatus* Ehrh. Pl. Crypt. (1793) n. 247.

Exs. Ehrh. l. c. — Floerk. Deutsch. Lich. II (1815) n. 36. — Fr. Lich. Suec. Exs. II (1818) n. 51. — Schaer. Lich. Hêlv. Exs. III (1823) n. 75. — Floerk. Clad. Exs. (1829) n. 2. — Hepp Flecht. Eur. I (1853) n. 112. — Nyl. Herb. Lich. Par. (1855) n. 24. — Rabenh. Lich. Eur. Exs. X (1857) n. 295, 296, Clad. Eur. (1860) tab. XXIV n. xxx 2, 3. — Stenh. Lich. Suec. Exs. n. 207 (sec. Th. Fr. Lich. Scand. p. 78). — Rehm Clad. Exs. (1869) n. 19, (1892) 410, 411. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 74. — Zahlbr. Krypt. Exs. Vindob. III (1893) n. 241. — Malme Lich. Suec. Exs. XXIX (1918) n. 702.

Icon. Fink Furth. Not. Clad. VIII (Bryologist 1906) tab. VIII f. 2.

Thallus primarius vulgo persistens, fragilissimus, KHO lutescens, squamis margine subtusque solediosus. Podetia brevia aut brevissima, ascypha, vulgo solediosa, strato corticali non evoluto aut raro cortice e zona gonidiali formato instructa, vulgo squamulosa, subalbida aut fuscescentia, KHO lutescentia. Conidangia materiam coccineam non continentia.

Distr. Ad lignum cariosum in pinetis ceterisque locis umbrosis siccisque, raro etiam in paludibus turfosis crescit. In provinciis merid. mediisque passim — sat rare et in territoriis desertis silvosisque sat frequenter. LIn.: In regione pinifera prope lacum Inarijärvi (Vain.). Ob.: Simo (V. Räsänen), Hailuoto ad Ulaburgum (E. Nylander). Kuus.: Ad Kitkajoki (F. Silén). OKaj.: Ohtosenvaara et Kylmäla in Kuhmo (Vain.). Kar. Vien. occ.: Ylikuittijärvi (Vain. Adj. Lich. Lapp. p. 114).

Podetia e superficie thalli primarii enata, basi persistentia aut subpersistencia, apice haud diu accrescentia, long. 3—10 (1—20), crass. 0.5—1 (0.3—3) mm, ascypha, simplicia aut parce ramosa, lateribus saepe longitudinaliter rugosis costatisve, lateri-

bus axillisque fissis integrisque, parietibus circ. 0.100—0.210 mm crassis, KHO lutescentia, quae reactio podetiorum thallique sec. Zopf (Beitr. Chem. Mon. Clad. p. 94) acido thamnolico, quod haec planta $2\frac{0}{10}$ continet, provocata est. Stratum chondroideum podetiorum inaequaliter incrassatum laceratumque vel costatum, circ. 0.120—0.030 mm crassum. Apothecia lat. 0.3—1.5 mm, in apicibus podetiorum aggregata, peltata basique constricta, primo aut persistenter tenuissime marginata. Sporae oblongae aut fusi-formi-oblongae aut rarius oblongo-ellipsoideae, long. 0.007—0.014, crass. 0.0025—0.0035 mm. Conidangia dolioliformia aut capituliformia, crass. 0.120—0.140 mm, basi constricta. Conidia subcylindrica, bene aut leviter curvata, long. 0.005—0.009, crass. vix 0.001 mm.

F. **quercina** (Pers.) Vain. l. c. I p. 470, II p. 461, III p. 238 (*Baeomyces quercinus* Pers. Zus. Bem. Flecht. in Ust. Ann. Bot. 7 St., 1794, p. 19). Podetia granulosa sorediosaque et squamulosa, decorticata, saepe demum fere ceraceo-semipellucida, strato medullari exteriore destituta. Est forma normalis frequentiorque hujus speciei.

F. **rugulosa** Vain. l. c. I p. 470, III p. 238. Podetia crusta, e strato gonidiali formata, verrucosa areolatae aut subcontinua obducta, esorediosa, esquamulosa. Ad Kylmälä in Kuhmo (OKaj.) et in Vällyvuori in Korpilampi (Ta.) legi.

Cl. caespiticia (Pers.) Floerk.

Clad. Comm. (1828) p. 8, Clad. Exs. (1829) n. 3; Vain. l. c. I p. 458, II p. 460, III p. 244. *Baeomyces caespiticius* Pers. in Ust. Ann. Bot. 7 St., 1794, p. 155.

Exs. Schrad. Syst. Samml. Crypt. (1797) n. 133. — Floerk. Clad. Exs. (1829) n. 3. — Schaer. Lich. Helv. Exs. XII (1836) n. 280. — Moug. et Nestl. Stirp. Voges. XII (1845) n. 1154. — Rabenh. Lich. Eur. Exs. X (1857) n. 282. — Hepp Flecht. Eur. III (1860) n. 544. — Rabenh. Clad. Eur. (1860) tab. XXIV n. 1, Clad. Eur. Supl. (1863) tab. XXIV n. 4. — Mudd Mon. Brit. Clad. (1865) n. 44. — Rehm Clad. Exs. (1869) n. 20. — Arn. Lich. Exs. (1883) n. 974. — Havaas Lich. Exs. Norv. (1902) n. 85.

Icon. Fink Furth. Not. Clad. VIII (Bryologist 1906) tab. VIII fig. 1.

Thallus primarius persistens, KHO non reagens, squamis esorediosis aut raro subtus granulosis sorediosisve. Podetia brevissima aut abortiva, ascypha, imperforata (aut apotheciis perforatis), esorediosa, ecorticata, squamis destituta aut rarius squamosa (humida semipellucida), subalbida pallidave, KHO non reagentia. Conidangia materiam coccineam non continentia.

Distr. Adhuc incerta in Fennia, sed in Suecia et Norvegia provenit. Specimen n. 39270 in herb. Nyl. supra Dicr. longif. ad saxum in Padasjoki a Norrl. a. 1866 collectum, huc a Nyl. ductum, apotheciis convexis, immarginatis, fuscis, tuberculoso-divisis confertisque in apice stipitis 1 mm longi, decorticati, haud distincte peltatis, squamis anguste incis, subtus partim parce granulosi, forsan ad *Cl. squamosam* aut ad *Cl. fimbriatum* f. *pycnotherizum* pertinet. Specimina alia, a Nyl. hoc nomine salutata, certe ad alias species pertinent.

Thallus primarius squamis circ. 2—10 mm longis, 0.200—0.210 mm crassis, laciniis circ. 0.3—1.2 mm latis. Podetia e superficie thalli primarii enata, circ. 1—5 mm longa aut abortiva, 0.4—1.5 mm crassa, simplicia aut raro parce ramosa, apicibus obtusis et fere semper apotheciiferis, clausa aut apice pervia, sparsa, erecta, parietibus circ. 0.090—0.180 mm crassis. Stratum medullare exterius podetiorum non evolutum. Stratum chondroideum bene evolutum, integrum. Apothecia vulgo mediocria aut majuscula, 0.7—2 (—3.5) mm lata, apicibus podetiorum affixa aut raro subsessilia, solitaria aut parcius aggregata, plana aut convexa, peltata basique bene constricta, vulgo primo distincte marginata aut rarius mox immarginata, testaceo-rufescentia aut fuscescentia. Sporae oblongae aut ovoideo-oblongae aut parcius fusiformi-oblongae, long. 0.008—0.016, crass. 0.003—0.004 mm. Conidangia superficiei thalli primarii affixa, sessilia, crass. 0.260—0.300 mm, conoideo-ovoidea aut ovoideo-verrucaeformia aut mamillaeformia aut subglobosa, basi paululum aut sat bene constricta, fuscescentia. Conidia subcylindrica, leviter aut bene constricta, long. 0.007—0.012, crass. 0.0005 mm. Sec. Zopf (Beitr. Chem. Mon. Clad. p. 94) haec planta continet acidum squamaticum (2.5 %) et acidum atranoricum (0.002 %).

21. *Cl. cenotea* (Ach.) Schaer.

Lich. Helv. Exs. III (1823) n. 71, XIX (1843) n. 460; Vain. l. c. I p. 471, 477, II p. 461, III p. 244. *Baeomyces cenoteus* Ach. Meth. Lich. (1803) p. 345. *Cl. uncinata* Hoffm. Deutschl. Fl. II (1796) p. 116 ?

Exs. Fr. Lich. Suec. Exs. II (1818) n. 55. — Schaer. l. c. — Hepp Flecht. Eur. IV (1867) n. 804, 805. — Stenh. Lich. Suec. Exs. n. 203 (sec. Th. Fr. Lich. Scand. p. 75). — Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 440, 441. — Malme Lich. Suec. Exs. XXI (1915) n. 512.

Icon. Arn. Lich. Exs. (1889) n. 1413, 1455.

Podetia longa — brevia, crassa aut sat tenuia, sub-tubaeformia aut raro subcylindrica, scyphifera, scyphis perviis, fere tota farinoso-sorediosa, decorticata aut rarius basin versus corticata, esquamulosa aut basin versus

squamulosa, impellucida, subglauescentia subalbidave aut cinereo-fuscescentia, KHO non reagentia. Conidangia breviter subcylindrica aut capituliformia, materiam coccineam parce aut raro nullam continentia.

Distr. Ad truncos putridos praesertim in silvis et ad lignum putridum supra tecta, rarius ad terram nudam locis apricis et ad terram turfiosam muscosque in paludibus turfiosis crescit, frequenter vel sat frequenter toto territorio proveniens. „In reg. silvatica Lapponiae occid. praesertim in regione coniferarum sat frequens, pluribus locis proveniens adhuc ad Kilpisjärvi“ (Norrl. Ber. Torn. Lappm. p. 321), sat frequenter in ceteris partibus Lapponiae Fennicae, sed haud notata e reg. subalpina (Vain. Adj. Lich. Lapp. I p. 114), „haud rara in Lapponia Kuollaënsi et adhuc ad Kuolla“ (N. I. Fellman in Nyl. Lich. Lapp. Or. p. 110), in luco ad Umpjavr in Lapponia Imandrensi (A. O. Kairamo).

Thallus primarius persistens aut demum evanescens, squamis 1—3 (—5) mm longis, 0.120—0.310 mm crassis, laciniis 1—0.2 mm latis, KHO non reagens. Podetia parietibus 0.255—0.150 mm crassis. Stratum chondroideum inaequaliter incrassatum, circ. 0.040—0.110 mm crassum, sine limite distincto in stratum medullare exterius transiens. Apothecia lat. 0.5—1.5 mm, in margine scyphorum aut in apicibus radorum ramulorumve irregularium plus minus aggregata aut subsolitaria, primo plana deindeque convexa, peltata basique constricta, saepe demum perforata aut reniformia lobatave, primo tenuissime marginata aut mox fere immarginata, livido-fuscescentia aut fusca aut carneo-pallida. Sporae oblongae aut ovoideae, rarius fusiformes, long. 0.012—0.008 mm, crass. 0.0035—0.0025 mm. Conidangia crass. 0.120—0.210 (—0.280) mm, breviter subcylindrica aut capituliformia aut conoideo-cylindrica aut raro ovoidea, basi non aut paululum aut raro bene constricta. Conidia subcylindrica, leviter aut bene curvata, long. 0.008—0.006, crass. 0.001 mm. Sec. Hesse (Journ. Prakt. Chem. 62, 1900, p. 449) haec species acidum uncinaticum continet, quod autem sec. Zopf (Beitr. Chem. Mon. Clad. p. 111) non differt ab acido squamatico.

Var. **crossota** (Ach.) Nyl.

Lich. Scand. (1861) p. 57; Vain. l. c. I p. 478, 479, III p. 244. *Cenomyce cenotea* b. *crossota* Ach. Syn. Lich. (1814) p. 272.

Podetia vulgo breviora, bene scyphifera, sterilia scyphis aut radiis brevibus obtusis terminata, tabulatis brevibus aut medio-cribus.

Est forma typica vulgarisque hujus speciei. Distributio supra indicata. — Podetia long. 5—70, crass. 0.7—2 (0.5—5) mm, scyphis obliquis aut regularibus, perviis, margine saepe incurvo, saepe demum prolifera, tabulatis circ. 5—25 mm longis. Conidangia materiam coccineam sat parce continentia.

Var. *exaltata* Nyl.

in Rehm Clad. Exs. (1886) n. 312; Vain. l. c. I p. 481, 491, II p. 461, III p. 244. *Cl. cenotea* β . *viminalis* Schaer. Lich. Helv. Spic. VI (1833) p. 315, Lich. Helv. Exs. XIX (1843) p. 460 (haud Floerk. Cl. Comm., 1828, p. 128); Vain. Adj. Lich. Lapp. I (1881) p. 114.

Exs. Schaer. Lich. Helv. Exs. XIX (1843) n. 460. — Hepp Flecht. Eur. IV (1867) n. 805. — Zwackh Lich. Exs. (1881) n. 629, (1883) n. 862, (1886) n. 948. — Rehm Clad. Exs. (1886) n. 312. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 676 (in **Cl. glaucam* accedens).

Podetia elongata, obsolete scyphifera, tabulato infimo vulgo elongato, apicibus attenuatis obtusisque.

Distr. Ad terram turfosam et sphagna putrida in paludibus turfosis crescit. Ad Laaso prope Hersala in Hollola (Vain.) in Ta. In Selkiinsuo in Pieksämäki in Sb. (Norrl.). Prope Templum in Kuhmo in OKaj. (Vain.). Ad Mourunki in Kempele in Ob. (specimen ad **Cl. glaucam* accedens, a M. E. Huuonen lectum).

Podetia long. 100—45, crass. 4—1 mm, irregulariter turgescencia aut subcylindrica, obsolete vel anguste scyphifera, scyphis axillisque perviis hiantibusque, repetito-proliferis, radiatis, radiis paucis aut solitariis, saltem tabulato infimo vulgo elongato, circ. 30—60 mm longo, apicibus vulgo ascyphis, saepe perviis, squamis squamulisque destituta aut basin versus vel dimidia parte inferiore squamulosa squamosave. Conidangia materiam coccineam parce aut nullam continentia.

22. **Cl. glauca* Floerk.

Vain. l. c. I p. 484, 491, II p. 461, III p. 244; Nyl. in Zwackh Rev. Clad. (1888) p. 2, p. 140; Aigret Mon. Clad. Belg. (1903) p. 140. *Cl. glauca* Floerk. Clad. Comm. (1828) p. 140; Sandst. Clad. Nordw. Tiefl. (1906) p. 430, II (1912) p. 365; Harm. Lich. Fr. III (1907) p. 273. Du Rietz Lich. Fragm. II (Sv. Bot. Tidskr. 1916) p. 472. *Cl. cenotea* b. *viminalis* Floerk. Clad. Comm. (1828) p. 128 (Arn. Lich. Exs. n. 1273). *Patellaria fusca* a. *furcata* a. *chneumaticus* Wallr. Naturg. Säulch.-Flecht. (1829) p. 158 (sec. Arn. Lich. Exs. n. 1342).

Exs. Floerk. Clad. Exs. (1829) n. 31. — Rabenh. Lich. Eur. Exs. X (1857) n. 283 (conidang. mat. cocc. cont.), Clad. Eur. (1860) tab. XIII n. xx 15, tab. XIV n. 15, tab. XV n. xxi 2, 4, Clad. Eur. Supl. (1863) tab. XVIII n. 6. — Zwackh Lich. Exs. (1859) n. 330, (1883) n. 824 A, (1884) n. 824 B, (1884) n. 871—875, 877, 878, (1886) n. 949, (1888) n. 1027 A, B, 1028 A, B, 1029 A, B, C, 1030, (1889) n. 1077, (1891) n. 1115—1120. — Arn. Lich. Exs. (1887) n. 1251, (1888) n. 1359 a, b, (1890) n. 1499. — Zahlbr. Krypt. Exs. Vindob. IV (1899) n. 353, XVI (1907) n. 1534 a, b. — Harm. Lich. Gall. Rar. Exs. I (1908) n. 22 (non vidi). — Malme Lich. Suec. Exs. XIX (1915) n. 453.

Icon. Arn. Lich. Exs. (1888) n. 1273, 1280, 1281, 1342, (1889) n. 1491 (1265 ?).

Podetia longa aut sat longa, tenuia aut sat tenuia, cylindrica aut raro elongato-tubaeformia, ascypha aut raro parce scyphifera, simplicia aut varie ramosa, scyphis perviis et axillis clausis aut perviis, vulgo tota crebre farinoso-sorediosa decorticataque aut rarius basin versus corticata, esquamulosa aut basin versus squamulosa, impellucida, vulgo subglaucescentia vel cinereo-glaucescentia aut subalbida, KHO non reagentia. Conidangia materiam coccineam non continentia aut raro continentia.

Distr. Ad terram sabulosam humosamque et ad muscos in pinetis et ericetis atque locis apricis siccis in Germania crescit. Omnino typica et constans in Fennia nondum collecta est, sed specimina a *Cl. cenotea* var. *exaltata* evoluta et in eam transeuntia, notas **Cl. glaucae* ostendentia, ad terram turfosa in palude turfoso Selkiinsuo in Pieksämäki in Savonia bor. collecta sunt (in Norrl. et Nyl. Herb. Lich. Fenn. cont. n. 676 cum v. *exaltata* distributa). Similis in ericeto ad Mourinki in Kempele in Ostrobothnia bor. (in herb. meo) una cum *Cl. cenotea* v. *exaltata* (leg. M. E. Huuonen).

Podetia apice haud diu aut sat diu accrescentia et basi simul emorientia, aut basi persistentia, long. circ. 25—80 (15—100) mm, crass. 0.7—1.5 (0.5—2.5) mm, vulgo cylindrica et aequaliter incrassata, apicibus vulgo sensim attenuatis subulatisque aut rarius obtusis, raro perviis aut scyphiferis, granulis sorediorum circ. 25—35 μ crassis, parietibus circ. 0.260—0.080 mm crassis, sec. Zopf (Flechtenst. p. 260, 408, Beitr. Chem. Mon. Clad. p. 95, 100) acidum squamaticum continentia. Stratum

chondroideum sine limite distincto in stratum medullare exterius podetiorum transiens. Apothecia lat. 0.3—0.7 mm, in apicibus ramulorum irregularium plus minus aggregata, peltata basique constricta, saepe perforata lobatave, primo plana deindeque convexiuscula convexave, primo tenuissime marginata aut mox fere immarginata, fusca aut livido-fuscescentia. Sporae oblongae aut ellipsoideo-oblongae, long. 0.010—0.007 mm, crass. 0.003—0.002 mm. Conidangia 0.180—0.280 mm crassa, conoidea aut subcylindrica aut rarius conoideo-ovoidea, basi non aut rarius paululum constricta. Conidia subcylindrica, leviter curvata aut p. p. fere recta, long. 0.010—0.006, crass. 0.0005—vix 0.001 mm.

b. *Megaphyllae* Vain.

Thallus primarius squamis bene evolutis, elongatis latisque, varie partitis aut integris, margine late lobato aut integro.

23. *Cl. turgida* (Ehrh.) Hoffm.

Deutschl. Fl. II (1796) p. 124; Vain. l. c. I p. 494, II p. 461, III p. 245. *Lichen turgidus* Ehrh. Pl. Crypt. (1793) n. 297. *Lichen parechus* Ach. Lich. Suec. Prodr. (1798) p. 185.

Exs. Ehrh. l. c. — Fr. Lich. Suec. Exs. V (1825) n. 147. — Sommerf. Pl. Crypt. Norv. I (1826) n. 73. — Fellm. Lich. Arct. (1864) n. 37. — Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 432, cont. (1921) n. 680, 681. — Havaas Lich. Exs. Norv. (1905) n. 267. — Zahlbr. Krypt. Exs. Vindob. XIII (1905) n. 1239. — Malme Lich. Suec. Exs. XXII (1915) n. 529.

Thallus primarius squamis lobato-laciniatis lobatisve. Podetia elongata, crassa, ascypha aut obsolete scyphifera, corticata, laevigata, esorediosa, squamis vulgo destituta. Conidangia materiam coccineam non continentia.

Distr. Ad terram humosam et muscos in silvis siccis et locis umbrosis aut subirriguis rupium crescit. In Lapponia est sat rara, sed pluribus locis in reg. silvaticis collecta (sec. mus. Fenn. et Norrl. Ber. Torn. Lappm. p. 320, Vain. Adj. Lich. Lapp. I p. 110, Kihlm. Neue Beitr. Flecht. Kola p. 46), in reg. subalpina montis Nattasentunturi in Sodankylä in LKem. et Päänuorunen in KKER. (sec. Vain. l. c.) et in Lujavurt in LMur. (sec. Kihlm. l. c.). In Tavastia sat frequenter provenit (sec. Norrl. Bidr. Sydöstr. Tav. Fl. p.

179, Vain. Fl. Tav. Or. p. 95), ceterum toto territorio passim aut sat frequenter.

Thallus primarius persistens aut demum evanescens, squamis long. 25—5, 0.3—0.2 mm crassis, laciniis 2—5 (1—7) mm latis, KHO superne et subtus lutescentibus. Podetia e superficie thalli primarii enata, apice haud diu aut sat diu accrescentia et basi simul demum emorientia aut persistentia, long. circ. 20—70 (—120), crass. 2—3 (1—5) mm, turbinato-turgescentia aut subcylindrica, ascypha aut scyphis parum dilatatis, diaphragmate cribroso aut perforato clausis, parum excavatis, margine radiatoproliferis, apicibus ascyphis obtusisque et breviter radiatis furcatisque aut anguste scyphiferis, axillis p. p. clausis, p. p. perforatis, vix umquam hiantibus, cortice subcontinuo aut demum subdisperso areolatove, squamis destituta aut interdum squamosa, albido-glauescentia subalbidave, partibus decorticatis albis, apicibus interdum cinereo- aut olivaceo-fuscescentibus, hydrate kalico lutescentia, parietibus 0.300—0.140 mm crassis. Stratum chondroidum podetiorum 0.140—0.020 mm crassum, passim hyphis discretis et strato medullari exteriori immixtum. Apothecia lat. 0.5—2 mm, in apicibus ramorum ramulorumque subcymose radiatimve dispositorum aggregata aut radiatim brevissimeque stipitata, primo tenuiter marginata planaque, deinde convexa et immarginata, peltata, saepe demum perforata aut reniformi-lobata, fusca aut testacea. Sporae oblongae aut rarius fusiformi- aut ovoideo-oblongae, long. 0.008—0.018, crass. 0.0025—0.0035 mm. Conidangia crass. 0.230—0.300 mm, ovoidea aut ovoideo-conoidea aut dolioliformia aut breviter cylindrica, basi distincte aut non constricta, fusconigra fuscave.

Obs. *F. corniculata* Sommerf. (Pl. Crypt. Norv., 1826, n. 73, Vain. l. c. I p. 499), podetiis ascyphis. — *F. scyphifera* Vain. (l. c. III p. 111, 245), podetiis p. p. scyphiferis. Minus frequenter, quam *f. corniculata*. — *F. squamulosa* (Rabenh.) Theobald (Flecht. Wetterau, 1858, p. 326, Vain. l. c. I p. 499, *Cl. furcata* A. *turgida* c. *squamulosa* Rabenh. Deutschl. Krypt.-Fl. II, 1845, p. 103), podetiis aliquantum squamosis, raro proveniens. Hae formae in eodem caespite observantur.

γ. Clausae Vain.

Thallus primarius bene evolutus, persistens aut demum evanescens, squamis comparate latius partitis aut latius crenatis lobatisve, vulgo crassiusculis. Podetia ascypha aut scyphis diaphragmate clausis instructa, axillis clausis. Apothecia majora mediocriave aut rarius parva, usque ad

marginem suffulta aut rarius infra marginem constricta peltataque. Conidangia materiam coccineam haud continentia.

a. Podostelides (Wallr.) Vain.

Thallus primarius squamis minoribus majoribusve, subtus albis. Podetia ascypha, semper aut vulgo apotheciis terminata, glaucescentia albidave aut fuscescentia, parietibus incrassatis et vulgo laceratis, cavitate angustiore (aut raro solida). Apothecia fusca aut testacea pallidave.

1. *Helopodium* (Ach.) Vain.

Podetia brevia aut sat brevia, apotheciis semper terminata (aut in nonnullis speciebus exoticis etiam sterilia). Conidangia vulgo thallo primario affixa.

24. *Cl. cariosa* (Ach.) Spreng.

Linn. Syst. Veg. IV (1827) p. 272; Vain. l. c. II (1894) p. 43, 462, III (1898) p. 248; Sandst. Clad. Nordw. Tiefl. II (1912) p. 367. *Lichen cariosus* Ach. Lich. Suec. Prodr. (1798) p. 198.

Thallus primarius squamis parvis aut mediocribus, KHO superne lutescentibus. Podetia brevia aut sat brevia (raro evanescentia), ascypha, apotheciis semper terminata, subfastigiata aut raro simplicia, lateribus vulgo rimosis, areolis corticatis sat parvis aut mediocribus, dispersis aut cortice rarius partim subcontinuo, esorediosa, vulgo esquamulosa, impellucida, KHO lutescentia. Stratum chondroideum ad cavitatem laceratum et in fibras divisum. Apothecia vulgo mediocria. Conidangia vulgo subcinerascentia.

Distr. Ad terram humosam locis subhumidis siccisve in campis apricis arenosis aut rarius etiam argillaceis praesertimque in turfosis desiccatis deustisve, rarius etiam ad terram humosam in rupibus et ad terram arenosam nudam crescit. In LTul.: Kuolla ad Mare Glaciale (N. I. Fellman). LKem.: Kolari (Norrl. Ber. Torn. Lappm. p. 319, mus. Fenn.). KKER.: In reg. subalp. montis Päänuorunen, reg. silv. ad Oulanka (Vain. Adj. Lich. Lapp. I p. 109). Kuus.: In reg.

subalp. montis Iivaara (Vain. l. c.). Ob.: Tervaharju in Kemi (V. Räsänen). In par. Kianta et meridiem versus passim — frequentius (Vain. l. c.).

Thallus primarius vulgo persistens, squamis circ. 7—1 mm longis, 0.380—0.120 mm crassis, esorediosis aut subtus margineve parcissime sparseque soresioso-granulosis, KHO superne subtusque lutescentibus aut subtus haud reagentibus. Podetia e lamina aut rarius e margine apiceve thalli primarii enata, long. 26—7 (raro —1) mm aut raro deficientia, crass. 2—0.7 (—4) mm, subcylindrica aut parte superiore incrassata, apice haud diu accrescentia, basi persistentia, KHO lutescentia, verisim. acidum atranoricum continentia [conf. Zopf Beitr. Chem. Mon. Clad. p. 97, ubi indicationes de *Cl. cariosa* spectant ad Arn. Lich. Exs. n. 1027 b, qui ad **Cl. Hungaricam* (Arn.) Vain. pertinet], parietibus crass. circ. 0.180—0.300 mm aut adhuc crassioribus. Apothecia lat. circ. 4—0.5 mm, confluentia aut conglomerata, vulgo demum perforata fissave aut lobata, demum bene convexa, immarginata, fusca aut rufofusca, nuda aut partim teauiter caesio-pruinosa. Sporae oblongae aut oblongo-fusiformes, long. 0.016—0.009, crass. 0.004—0.0025 mm. Conidia in superficie margineve thalli primarii sita, crass. 0.40—0.24 mm, subglobosa aut ovoidea, basi bene constricta, vulgo cinerascencia aut cinereo-fuscescentia aut rarius nigricantia. Conidia subcylindrica, leviter curvata aut subrecta aut parcius etiam bene curvata, long. 0.008—0.010, crass. 0.0005 mm.

F. cribrosa (Wallr.) Vain. l. c. II p. 50, III p. 248. *Patellaria fusca* c. *symphycarpa* †† m. *cribrosum* Wallr. Naturg. Säulch.-Flecht. (1829) p. 121. — Exs. Fr. Lich. Suec. Exs. V (1825) n. 149. — Stenh. Lich. Suec. Exs. n. 185 (sec. Th. Fr. Lich. Scand. p. 90). — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 58. — Havaas Lich. Exs. Norv. (1905) n. 266. — Podetia bene evoluta, squamis destituta, cortice disperso. — Distr. Est forma frequentior hujus speciei.

F. pruniformis Norm., Vain. l. c. II p. 52, III p. 248. *Cl. pyxidata* **Cl. cariosa* v. *pruniformis* Norm. Spec. Loc. Nat. Norv. (1868) p. 345. „*Cl. cariosan* epiphylli muoto“ Vain. Tutk. Clad. Phylogenet. Kehit. (1880) p. 28, 29. — Apothecia sessilia aut p. p. breviter stipitata. Podetia evanescentia. — **Distr.** Ad terram humosam in campo humido et supra muscos destructos in rupibus et ad terram arenosam collecta. Tölö ad Helsingforsiam (Vain.), Somerikonvuoret Hoglandiae (Vain.), in ripa ad Pitkäkoski in Sippola in Ka. (V. Kujala).

Obs. *Cl. pityrodes* Nyl. (Fl. 1872 p. 353) tantum podetiis circ. 2 mm longis a f. *pruniformi* differt (sec. herb. Nyl.).

F. corticata Vain. l. c. II p. 53, III p. 248. — Exs. Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 710, 711. — Podetia bene evoluta, squamis destituta, partim cortice subcontinuo instructa, lateribus subintegris. — **Distr.** Ad terram humosam et arenosam et inter muscos locis calcariis et in campis collecta. Ab.: Pellonkylä in Karjalohja (J. P. Norrlin). Ta.: Nyystölä in Padasjoki (Vain.), Onkisalo in Luhanka (Vain.). KLad.: Ruskeala (H. Zilliacus, exs. cit. n. 711). KOn.: Suojärvi („Cl. cervicornis“ sec. det. Nyl. in Norrl. Fl. Kar. Oneg. II p. 13). Kb.: Lieksa (Vain.).

Obs. *F. integrrior* Nyl. (Fl. 1876 p. 560, Vain. Fl. Tav. Or., 1878, p. 94, Adj. Lich. Lapp. I, 1881, p. 109, Mon. Clad. Univ. II p. 57), podetiis haud aut minus ramosis et cortice podetiorum minus continuo a *f. corticata* leviter differens, ab ea vix distinguenda est.

F. squamulosa (Müll. Arg.) Vain. l. c. II p. 57, 462, III p. 248. *Cl. symphylicarpa* var. *squamulosa* Müll. Arg. Lich. Beitr. XV n. 385 (Fl. 1882 p. 298) p. p. — Exs. Rehm Clad. Exs. (1893) n. 433 (in *f. corticatam* transiens). — Malme Lich. Suec. Exs. XXVIII (1917) n. 681. — Podetia squamosa. — **Distr.** Tölö Helsingforsiae (Vain.). Mustiala in Ta. (A. Kullhem). Savonia (E. Nylander).

25. *Cl. Hungarica (Arn.) Vain.

„*Cl. cariosa* pl. hungarica, thallo magis foliaceo, apotheciis plus minus botryosis“ Arn. Lich. Exs. (1884) n. 1027 b. — „*Cl. alcicornis* b. *microphyllina* Fr.“ in Hepp Flecht. Eur. IV (1867) n. 799. — „*Cl. cariosa* f. *macrophylla* apoda Nyl.“ (Lich. Lapp. Or. p. 176) in Rehm Clad. Exs. (1869) n. 2. *Cl. glauvina* Coem. in mscr. (conf. p. 81).

Thallus primarius squamis vulgo elongatis, rarius sat brevibus, KHO superne lutescentibus et ad apices demum aurantiaco-rubrescentibus. Podetia e margine thalli primarii enata, brevia aut sat brevia (aut raro evanescentia), ascypha, apotheciis semper terminata, subfastigiata aut simplicia, lateribus vulgo integris, cortice subcontinuo aut subcontigue areolato, esorediosa, squamis destituta aut squamosa, impellucida, KHO dilute lutescentia. Stratum chondroideum ad cavitatem leviter aut parum laceratum. Conidangia rufo-fuscescentia aut fusco-nigricantia.

Distr. Ad muscos destructos (Andreaeam petrophilam) in regione subalpina montis Päänuorunen in Karelia Kertina („*Cl. cariosa* lusus epiphyllus in f. fere typicam transiens“ Vain. Adj. Lich. Lapp. I, 1881, p. 109), specimen

haud typicum, squamis thalli demum 14 mm longis, KHO cum CaCl_2O_2 subtus p. p. demum dilute lutescentibus et ad marginem maculis aurantiaco-rubrescentibus, p. p. haud reagentibus, podetiis 5 mm longis aut evanescentibus, apotheciis fuscis. Suojärvi in Karelia (Norrl.). Videas p. 81.

Ex hac planta (Arn. Lich. Exs. n. 1027 b) Zopf analysi chemica recepit acidum atranoricum et bryopogonicum, quorum posterius (sec. Zopf Flechtenstoff. p. 213, Beitr. Chem. Mon. Clad. p. 97) hydrate kalico solutionem luteam, demum rubescentem, effundit, quare Sandstede (Clad. Nordw. Tiefl. II p. 368) hunc lichenem ad *Cl. subcariosam* verisimiliter pertinere indicat. Revera inter *Cl. cariosam* et *Cl. subcariosam* est intermedia, sed in priorem et notis chemicis et morphologicis transire videtur. Thallus primarius persistens, squamis saepe 15—5 mm longis, esorediosis aut subtus parcissime sparseque subsorediosogranulosis, laciniis 0.7—1.5 (—2.5) mm latis, vulgo sublinearibus, leviter sinuatis crenatisve, superne glaucescentibus, subtus albis, KHO superne lutescentibus et ad apices demum leviter aurantiaco-rubrescentibus, subtus leviter lutescentibus, zona gonidiali et granulis in lamina inferiore sitis aurantiaco-rubrescentibus, quae reactiones addito CaCl_2O_2 distinctiores evadunt. Podetia ex apice thalli primarii enata, long. circ. 15 mm aut breviora, raro deficiencia, crass. circ. 1—4 mm, subcylindrica aut irregularia aut parte superiore incrassata, apice haud diu accrescentia, basi persistentia, glaucescentia (aut raro subolivacea), KHO, addito CaCl_2O_2 , distinctius lutescentia, parietibus circ. 0.25—0.36 mm crassis. Stratum myelohyphicum dentes trabesque in stratum chondroideum penetrantes formans et inaequaliter limitatum. Stratum chondroideum maxima parte strato myelohyphico immixtum. Apothecia 1.5—0.3 mm lata, saepe conglomerata, vulgo demum perforata fissave aut lobata, convexa, immarginata, basi constricta, vulgo rufotestacea aut rarius subtestacea, nuda aut p. p. tenuiter pruinosa. Conidangia subglobosa, basi constricta.

Obs. 1. „*Cl. cariosa* var. *sobolifera* (Del.)“ in Coem. Clad. Belg. I (1863) n. 19 est **Cl. Hungarica* (Arn.), thallo superne et inferne dilute lutescente, margine aurantiaco-rubescete, conidangiis globosis, fusco-nigricantibus, apotheciis haud evolutis, et a Nyl. in Lich. Lapp. Or. (1866) p. 176 nominatur „*Cl. cariosa* macrophylla apoda“ et in Hue Lich. Exot. (1892) p. 324 n. 3688 a Nyl. refertur ad *Cl. sobolescentem* Nyl., quae, in Tennessee a Calkins collecta, autonoma est species, squamis partim latioribus instructa, reactiones alias praebens materiasque alias continens (podetia KHO demum obscurata, nec lutescentia).

Nomen *apoda*, jam ante in alio sensu adhibitum, etiam ineptum est **Cl. Hungaricae*, quae podetiis bene evolutis instructa est. — *Cl. glauca* Coem. mscr., a Nyl. in Lich. Jap. (1890) p. 20 commemorata, ad **Cl. Hungaricam* (Arn.) pertinet (sec. specim. orig.).

Obs. 2. *F. symphy carpodes* (Nyl.) Vain., podetiis evanescentibus, apotheciis subsessilibus, zona gonidiali ad apices thalli KHO aurantiaco-rubescente instructa, supra muscos destructos in Pöppönsaari in Suojärvi in Karelia a Norrl. collecta („*Cl. cervicornis* var. *symphy carpodes*“ sec. Nyl. in mus. Fenn., Vain. l. c. II, 1894, p. 52), est forma **Cl. Hungaricae*, analoga *Cl. cariosae* f. *pruniformi* Norm. — *Cl. symphy carpodes* Nyl. Fl. 1874 p. 7 (Hue Addend. I, 1886, p. 27) sec. herb. Nyl. (n. 38554) spectat ad *Cl. caespiticiam* (Pers.) Floerk., quae immixta numero 510 in Schaer. Lich. Helv. Exs. (in collectione alicujus, forsan Stizenbergeri) aderat (conf. Vain. l. c. II p. 53, 56).

Cl. subcariosa Nyl.

Lich. Jap. (1890) p. 20 (sec. herb. Nyl., haud Fl. 1876 p. 560; Arn. Lich. Jur. (1890) p. 18; Vain. l. c. II p. 38, 360, 462, III p. 247); Kieffer Flecht. Lothr. (Hedwigia 1894) p. 104; Aigret Mon. Clad. Belg. (1903) p. 144; Fink in Bryologist 1906 p. 97; Harm. Lich. Fr. III (1907) p. 280; Malme Lich. Not. 7 (Sv. Bot. Tidskr. 1916) p. 81; Magnusson Mat. Västkr. Lavfl. (l. c. 1919) p. 82. *Cl. polycarpoides* Nyl. in Zwackh Lich. Exs. ed. secunda schedularum (1892) n. 626 et 626 bis.

Exs. Tuck. Lich. Am. Exs. V (1854) n. 116. — Coem. Clad. Belg. I (1863) n. 11, 12, 13. — Wright Lich. Cub. ser. II n. 92. — Zwackh Lich. Exs. (1881) n. 626, (1884) n. 626 bis. — Lojka Lich. Univ. (1885) n. 3. — Rehm Clad. Exs. (1886) n. 315. — Arn. Lich. Exs. (1897) n. 1722. — Zahlbr. Krypt. Exs. Vindob. IX (1903) n. 866.

Icon. Fink Furth. Not. Clad. VII (Bryologist 1906) tab. IV fig. 1.

Thallus primarius squamis vulgo elongatis, KHO superne rubescentibus. Podetia vulgo e margine thalli primarii enata, vulgo brevia aut sat brevia, ascypha, apotheciis semper terminata, simplicia aut apice ramulosa, lateribus vulgo integris, cortice subcontinuo aut subcontingue areolato, esorediosa, vulgo equamulosa, impellucida, KHO demum rubescentia. Stratum chondroideum ad cavitatem haud lacertatum. Apothecia vulgo mediocria.

Distr. In Fennia nondum collecta.

Facie externa subsimilis est *Cl. cariosae* v. *corticatae*, reactione podetiorum thalliche et squamis thalli primarii vulgo magis elongatis et colore conidangiorum ab ea differens. A **Cl. Hungarica*, etiam in Fennia proveniente, vix nisi reactionibus distinguitur. *Cl. subcariosa*, sicut etiam **Cl. Hungarica*, acidum bryopogonicum continere videtur,

sed abundantius, quare reactionem intensiorem praebet, quam posterior. — Thallus primarius persistens aut subpersistens, squamis 17—3 mm longis, circ. 0.36—0.050 mm crassis, esorediatis, laciniis 4—0.7 mm latis, subcuneatis aut sublinearibus, sinuatis crenatisve, superne glaucis aut olivaceo-fuſcescentibus aut cinereo-glauescentibus, KHO superne demum rubescentibus, subtus dilute lutescentibus aut solum maculis rubescentibus aut haud reagentibus. Podetia long. 5—15, rarius 1.5—30 mm, crass. (parte media) 0.5—4 mm, subcylindrica aut parte superiore clavato-incrassata, colore thalli, KHO rubescentia aut primum sublutescentia, parietibus circ. 0.240—0.160 mm crassis. Apothecia circ. 4—0.5 mm lata, fusco-rufescentia aut raro testaceopallida. Sporae oblongae aut oblongo-fusiformes, long. 0.013—0.008, crass. 0.0035—0.002 mm. Conidangia lat. 0.2—0.25, rarius —0.4 mm, subglobosa aut rarius ovoideo-ampullacea, basi bene constricta, fusca aut fusco-nigra. Conidia subcylindrica, leviter curvata aut subrecta, long. 0.007—0.010, crass. vix 0.001 (0.0005) mm.

Obs. *Cl. subcariosa* Nyl. Fl. 1876 p. 560 secund. specim. orig. ex Jamaica n. 38700 in herb. Nyl. (a Wulschlaegel collectum), podetiis KHO non reagentibus (testaceis post horas plures) instructa, est normalis *Cl. mitrula* Tuck. in Darl. Fl. Cestr. 3 ed. (1853) p. 444, quare hoc nomen denuo est liberum et adhiberi potest speciei nostrae. Nylander ipse primus in determinationibus et scriptis suis erravit, in alio sensu hoc nomen postea adhibens. Jam Wrighti Lich. Cub. ser. 2 n. 92, cujus specimina in herb. Müll. Arg. et Tuck. et Nyl. vidi, nomine *Cl. subcariosae* determinavit.

2. *Macropus* Vain.

Podetia longitudine vulgo mediocria, partim etiam sterilia. Apothecia vulgo usque ad marginem suffulta, typice fusca. Conidangia apicibus lateribusve podetiorum affixa.

26. *Cl. alpicola* (Flot.) Vain.

l. c. II p. 58, III p. 249; Harm. Lich. Fr. III (1907) p. 285. *Cl. pyxidata* β . *alpicola* Flot. in Fl. 1825 p. 340 (Lich. Fl. Siles. p. 30). *Cenomyce foliosa* Sommerf. in litt. sec. Floerk. Clad. Comm. (1828) p. 17. *Cl. ventricosa* β . *macrophylla* Schaer. Lich. Helv. Spic. VI (1833) p. 316, Lich. Helv. Exs. (1836) n. 279. *Cl. decorticata* (Fr.) Nyl. Coll. Fl. Kar. (1852) p. 177, cont. (1852) p. 199, Addit. Fl. Hels. (1852) p. 218, Syn. Lich. p. 199 (haud Floerk. Besch. Braunfr. Becherfl., 1810, p. 297). *Cl. macrophylla* Th. Fr. Fl. 1861 p. 455; Nyl. Fl. 1873 p. 299; Vain. Adj. Lich. Lapp. I (1881) p. 110.

Exs. Fr. Lich. Suec. Exs. III (1824) n. 81. — Schaer. Lich. Helv. Exs. XII (1836) n. 279. — Sommerf. Plant. Crypt. Norv. II (1836) n. 159 (sec. Th. Fr. Lich. Scand. p. 91). — Hepp Flecht. Eur. III (1860) n. 545. — Rabenh. Clad. Eur. (1860) tab. XI n. xviii 1, 2, 4. — Stenh. Lich. Suec. Exs. VII p. 186 (sec. Th. Fr. l. c.). — Arn. Lich. Exs. (1874) n. 579 a—c, (1877) n. 579 d. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 68, cont. (1921) n. 708. — Rehm Clad. Exs. II (1875) n. 55, 56, X (1890) n. 384. — Havaas Lich. Norv. Exs. (1904) n. 245. — Harm. Lich. Gall. Rar. Exs. I (1908) n. 23 (non vidi). — Malme Lich. Suec. Exs. XXI (1915) n. 515. — Zahlbr. Krypt. Exs. Vindob. XXIV (1916) n. 2356.

Icon. Arn. Lich. Exs. (1888) n. 1292, (1889) n. 1486.

Thallus primarius squamis crassis, vulgo latis aut late lobatis, strato corticali crasso. Podetia e lamina thalli enata, long. vulgo mediocria, raro elongata aut brevia, ascypha, fertilia aut sterilia, lateribus vulgo rimosis sulcatisque, vulgo late decorticata, areolis verrucisque corticatis vulgo dispersis, vulgo demum in squamas peltatas, centro affixas, excrescentibus, esorediata, impellucida, KHO non reagentia. Stratum chondroideum valde laceratum fibrosumve. Apothecia vulgo majora. Conidangia majora.

Distr. Ad terram humosam locis humidis subhumidisve in rupibus et saxis, rarius ad terram nudam arenosam in campis siccis, in regionibus arcticis saepe etiam ad terram humosam in campis crescit. Sat frequenter in omnibus regionibus Lapponiae Fennicae (Vain. Adj. Lich. Lapp. I p. 110, Norrl. Ber. Torn. Lappm. p. 319), in Lapponia Kuollaënsi pluribus locis collecta, ceterum passim — sat frequenter toto territorio.

Thallus primarius persistens aut rarius demum evanescens, squamis longitudine latitudineque circ. 8—3 mm, crass. 0.520—0.200 mm, esorediatis, KHO non reagentibus, strato corticali 0.060—0.110 mm crasso. Podetia long. circ. 60—10 mm (aut raro breviora), parte media crass. 5—0.8 mm, cylindrica, esorediosa aut apicem versus demum parcissime granuloso-verruculosa (haud vere soresdiosa), partibus decorticatis cinereo- aut pallidofuscescentibus obscuratisve aut albidis, verrucis et squamis glaucescentibus aut cinereo- vel olivaceo- vel fusco-glaucescentibus, apice haud diu accrescentia, parietibus circ. 0.460—0.140 mm crassis (laciniis strati chondroidei haud computatis), sec. Zopf (Beitr. Chem. Mon. Clad. p. 87) acidum psoromicum continentia

(conf. Zopf Flechtenst. p. 198). Stratum chondroideum indistincte limitatum, ad cavitatem podetiorum valde laceratum fibrosumve laciniisque magnis. Apothecia lat. 5—0.7 mm, immarginata aut primo tenuiter marginata, primo plana aut mox convexa, fusca aut rufo-fusca aut raro testacea, epruinosa. Sporae oblongae aut oblongo-ellipsoideae aut fusiformi-oblongae, long. 0.007—0.012, crass. 0.003—0.002 mm. Conidangia lat. circ. 0.420 mm, ampullacea aut breviter ovoideo- aut subgloboso-ampullacea, basi bene constricta, fusco-nigra. Conidia subcylindrica, curvata, long. 0.012—0.007 mm, crass. vix 0.001 mm.

Var. *foliosa* (Sommerf.) Vain.

l. c. II p. 60, III p. 249.

Thallus primarius squamis vulgo majusculis latisque. Podetia cortice areolato aut verrucoso verruculose, areolis verrucisque vulgo dispersis aut rarius contiguis, demum vulgo in squamas peltatas exrescentibus, inter areolas corticatas usque ad basin decorticata.

Distr. supra indicata ad hanc var. spectat.

Obs. *F. macrophylla* (Schaer.) Vain., podetiis circ. 60—25 mm longis, apothecio terminatis, simplicibus aut subsimplicibus. Est forma typica hujus speciei. — *F. Mougeotii* (Del.) Vain. (*Cenomyce Mougeotii* Del. in herb., Nyl. Bot. Zeit. 1861 p. 352), podetiis long. 60—15 mm, bene ramosis aut p. p. subsimplicibus, sterilibus aut apotheciis minutissimis abortivis. Minus abundanter distributa, quam forma praece-dens. — *F. minor* Vain. (l. c. II p. 64, III p. 249), podetiis long. 17—3 mm, simplicibus aut subsimplicibus, fertilibus, cortice verrucoso-areolato, verrucis partim dispersis, partim contiguis. Ad terram in campis siccis ad Pankajärvi in par. Lieksa in Kb. (Vain.).

Var. *Karelica* Vain.

l. c. II p. 65, III p. 249. *Cl. symphyrcarpa* var. *Karelica* Vain. Adj. Lich. Lapp. I (1881) p. 108. *Cl. symphyrcarpa* Fr. Lich. Suec. Exs. VIII (1826) n. 232 (in mus. Paris. et Berol.), Nov. Sched. Crit. (1826) p. 20 (Vain. Mon. Clad. Univ. II p. 55), nec Ehrh., nec Ach. *Cl. pyxidata* f. *symphyrcarpa* Th. Fr. Lich. Scand. (1871) p. 89.

Thallus primarius squamis minoribus, angustius crenatis laciniatisve. Podetia breviter, apotheciis semper terminata, subcontinue corticata aut partim areolis contiguis.

Distr. Ad terram arenosam loco aprico prope pag. Lieksa in Kb. (Vain.) et in Kyrkslätt in N. (A. Kullhem).

27. *Cl. decorticata* (Floerk.) Spreng.

Linn. Syst. Veg. IV (1827) p. 271; Floerk. Clad. Comm. (1828) p. 10; Th. Fr. Lich. Arct. (1860) p. 148; Nyl. Fl. 1873 p. 299, Fl. 1875 p. 447; Vain. l. c. II p. 67, III p. 250. *Capitularia* Floerk. Besch. Braunfr. Becherfl. (1810) p. 297.

Exs. Floerk. Deutsch. Lich. IV (1815) n. 75. — Tuck. Lich. Am. Exs. (1854) n. 124. — Rabenh. Clad. Eur. Supl. (1863) tab. XVI B n. 3. — Coem. Clad. Belg. II (1866) n. 104. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 69, cont. (1921) n. 709. — Zwackh Lich. Exs. (1881) n. 628. — Arn. Lich. Exs. (1883) n. 979, (1886) n. 1150. — Rehm Clad. Exs. (1883) n. 194, (1885) n. 272, 274, (1893) n. 432. — Zahlbr. Krypt. Exs. Vindob. n. 2456.

Icon. Fink in Bryologist 1907 p. 42 f. 2.

Thallus primarius squamis tenuioribus, minoribus, sat anguste laciniatis, strato corticali tenuiore. Podetia e lamina thalli enata, long. vulgo mediocria, ascypha, fertilia aut sterilia, lateribus subintegris, inter verruculas corticatas dispersas decorticata, parce granulosa, superne squamulosa, inferne squamosa, impellucida, KHO non reagentia. Stratum chondroideum ad cavitatem paululum laceratum. Conidangia minora.

Distr. Ad terram nudam arenosam aut humosam in campis siccis et locis apricis, raro ad terram humosam in saxis et rupibus crescit. OKaj.: Ad Saarijärvi in Kianta (Vain.). Kb.: Ad oppid. Nurmest et ad Pankajärvi in Lieksa (Vain. Adj. Lich. Lapp. I p. 109). Tb.: Nisula in Jyväskylä (K. Linkola). Ta.: Passim in Korpilahti et Luhanka (Vain. Fl. Tav. Or. p. 94), ceterum in Evo, Padasjoki, Asikkala, Hollola, Tammela. KOn.: Suojärvi (J. P. Norrlin). KOL.: Schtjeliki (F. Elfving). N.: Stansvik in Degerö prope Helsingforsiam (Vain.).

Thallus primarius demum evanescens, squamis circ. 4—1 mm longis, 1—2 mm latis, 0.150—0.180 mm crassis, strato corticali 0.040—0.020 mm crasso. Podetia e lamina thalli primarii enata, long. circ. 10—30 (—40) mm, crass. 2.5—0.7 (—0.5) mm, cylindrica, simplicia aut leviter ramosa, partibus decorticatis albis aut cinereis aut cinereo-fuscescentibus, verruculis squamulisque albido- aut cinereo- aut olivaceo-glauescentibus, KHO non reagentibus, apice haud diu accrescentia, parietibus 0.280—

0.200 mm (0.320—0.450 mm verruculis computatis). Stratum chondroideum indistincte limitatum. Apothecia lat. 5—0.7 mm, immarginata aut primo tenuiter marginata, primo plana aut mox convexa, fusca aut rufo-fusca, epruinosa. Sporae oblongo-fusiformes oblongaeve, long. 0.007—0.014, crass. 0.003—0.0025 mm. Conidia subcylindrica, bene aut leviter curvata, long. 0.005—0.006, crass. circ. 0.0005 mm. Conidangia lat. 0.260—0.240 mm, ovoidea, basi bene constricta, fusconigra.

28. Cl. Norrlini Vain.

Cladonia acuminata Norrl. in Herb. Lich. Fenn. II (1875) n. 57 a; Nyl. Fl., 1875 p. 447 p. p. (haud *Cenomyce pityrea* b. *acuminata* Ach. Syn. Lich., 1814, p. 254); Vain. l. c. II p. 73, III p. 250 p. p.

Exs. Norrl. et Nyl. l. c. — Zwackh Lich. Exs. (1897) n. 1179.

Thallus primarius squamis mediocribus aut parvis, sat tenuibus, vulgo sat anguste laciniatis, strato corticali tenuiore. Podetia vulgo e lamina thalli enata, long. vulgo mediocria, ascypha, fertilia aut sterilia, lateribus subintegris aut rimosis, decorticata, vulgo bene granuloso-sorediosa, aut raro cortice minute areolato verruculoso, disperso, esquamulosa aut basin versus squamosa, impellucida, KHO lutescentia. Stratum chondroideum haud aut paulum laceratum. Conidangia majora.

Distr. Ad terram humosam arenosamque in rupibus et campis, etiam locis calcariis. N.: Storsundsharun prope Tvärminne (E. Häyrén). Ta.: Evo (J. P. Norrlin), Saksala in Padasjoki (Vain., n. 39284 in herb. Nyl.), Taipale prope Heinola (V. Kujala). Sb.: In calcefodina ad Jynkkä prope Kuopio (K. Linkola). Kb.: Ad oppidum Nurmes (Vain.).

Thallus primarius demum evanescens, squamis circ. 5—2 mm longis, crass. circ. 0.160 mm aut crassioribus, majoribus vulgo sat anguste laciniatis, esorediosis aut margine subtus parce granulosus, KHO sat dilute lutescentibus, strato corticali circ. 0.040—0.060 mm crasso. Podetia e lamina aut p. p. e margine thalli primarii enata, long. circ. 15—40 mm, crass. 0.8—3 mm, subcylindrica, apicem versus aut rarius inferne irregulariter aut subfastigiatim ramosa aut simplicia, tota decorticata aut basin versus cortice verruculoso subareolato instructa, verruculis areolisque minutis dispersisque, partim vel omnino demum in squamulas squamasve excrescentibus, partibus decorticatis albis

albidisve, granulis verruculisque cinereo- vel albedo-glauescentibus, parietibus 0.330—0.120 mm. Stratum chondroideum indistincte limitatum, crass. circ. 0.080—0.160 mm. Apothecia lat. circ. 3—0.7 mm, convexa, immarginata, rufa aut rufo-fusca, epruinosa. Sporae oblongo-fusiformes oblongaeve aut parcius oblongo-ovoideae, long. 0.016—0.019, crass. 0.0035—0.003 mm. Conidangia incognita [in Vain. l. c. II p. 76 descripta non ad *Cl. Norrlini* pertinent, sed ad veram **Cl. acuminatam* (Ach.) Vain.], verisimiliter ab iis **Cl. acuminatae* (Ach.) Vain. non differentia.

Obs. F. *prisca* Vain. (*Cl. acuminata* f. *prisca* Vain. Adj. Lich. Lapp. I, 1881, p. 109, Mon. Clad. Univ. II, 1894, p. 76, III p. 250 p. p.), podetiis haud granulosis, KHO olivaceo-sublutescentibus vel sordide reagentibus, increbre verruculosus, ceterum usque ad basin decorticatus, superne partim squamulosus, parte inferiore squamosus instructa, *Cl. cerasphoram* in memoriam revocans, inter muscos in saxo ad litus cataractae Poussu in Kuus. lecta (Vain.).

29. **Cl. acuminata* (Ach.) Arn.

Cenomyce pityrea b. *acuminata* Ach. Syn. Lich. (1814) p. 254 (sec. specim. orig. ex Helvetia in herb. Ach.). *Cl. acuminata* Arn. Lich. Exs. (1883) n. 1025, Lich. Tirol XXIII (1887) p. 107. *Cl. acuminata* f. *foliata* Arn. Lich. Exs. (1883) n. 1026, Lich. Tirol XXIII (1887) p. 107 (p. maj. p.), Lich. Jur. (1890) p. 18. **Cl. foliata* Vain. Mon. Clad. Univ. II (1894) p. 79, III (1898) p. 250.

Exs. Arn. Lich. Exs. (1883) n. 1025, 1026, (1885) n. 1094 d (1094 c, p. p.). — Rehm Clad. Exs. (1885) n. 275, 276. — Zahlbr. Krypt. Exs. Vindob. XX (1912) n. 1962.

Thallo primario et podetiis KHO lutescentibus deindeque rubescentibus a *Cl. Norrlini* differt.

Distr. Ad terram humosam et argillaceam arenosamve locis apricis et in pinetis increbris, et inter muscos ad terram humosam in rupibus et saxis crescit. Lapp. Suec.: In reg. sylvatica in Mustavaara prope pag. Närvä in par. Kaaresuanto (G. Lång, Zahlbr. Exs.). LKern.: Venäjoki in Kittilä (G. Lång). Kker.: Oulanka (Vain.). OKaj.: Suomula (sec. annot.) et Saarikoski in Kianta (Vain.), Kylmälä (sec. annot.) in Kuhmo (Vain.). Kb.: Hiidenportti et Konnanlampi in par. Nurmes (Vain.). Sb.: Korsumäki ad Hiltulanlahti in Kuopio (K. Linkola). KOn.: Pertnavolok et Tiudie (A. Kullhem), Valkeamäki et Jänkjärvi (J. P. Norrlin). KOL.: Saarimäki ad

Tulemajärvi (K. Linkola). KLad.: Viinajoki ad Höksälä in Ruskeala (K. Linkola). Ta.: Piililä in Korpilahti et Markkula in Luhanka (Vain.), e Tav. austr. etiam in herb. Nyl. (n. 39280, leg. Norrl.). N.: Ad Irjala in Kerava (sec. annot.), nonnullis locis ad Tvärminne (E. Häyrén). Ab.: Hermola et Lylyis in Lohja (C. E. Boldt), ins. Bässen ad Pyhänsuu in Pargas (K. Linkola), Tallholmen in Tenala (E. Häyrén).

Haec species analogae est **Cl. Hungaricae* et *Cl. subcariosae*, et forsitan item acidum bryopogonicum et atranoricum continet. In *Cl. Norrlini* transire videtur et ei proxime affinis. Thallus primarius KHO superne et inferne lutescens deindeque rubescens (praesertim superne et zona gonidialis, addito CaCl_2O_2 distinctius reagens), laciniis circ. 3—7 (—17) mm longis, 0.8—3 mm latis. Podetia vulgo e lamina thalli primarii enata, long. circ. 20—50, crass. 1—2.5 (0.8—6) mm, subcylindrica, ascypha, praesertim apicein versus irregulariter aut subfastigiatim ramosa aut simplicia, increbre parceve aut bene granuloso-sorediosa aut nonnulla esorediosa, verruculis areolisve parvis, increbris parcisve, corticatis instructa, ceterum decorticata, crebre parceve squamosa squamulosaque aut squamis fere destituta, impellucida, partibus decorticatis albis albidisve, granulis verruculisque albidis vel cinereoglauescentibus, KHO lutescentia deindeque mox aurantiacorubescientia aut solum punctis rubescentibus. Apothecia lat. 3—0.8 mm, fusco-rufa, epruinosa, convexa, immarginata. Sporae „oblongo-fusiformes oblongaeve, long. 0.010—0.017, crass. 0.003—0.004 mm“ sec. annot. Nyl. Conidia lat. 0.550—0.400, late mamillaeformi-ampullacea aut breviter ovoidea, basi bene contracta. Conidia subcylindrica, sat leviter curvata, long. 0.005—0.008, crass. 0.0005 mm.

Obs. 1. *F. foliata* Arn. (Lich. Exs., 1883, n. 1026, Vain. l. c. II p. 80), podetiis squamosis instructa, ad terram argillaceam prope Markkula in Luhanka collecta est (Vain.).

Obs. 2. In specimine orig. ex Helvetia in herb. Ach. podetia KHO lutescentia deindeque rubescentia, quare licheni a Norrl. et Nyl. in Herb. Lich. Fenn. n. 57 exhibito nomen *Cl. Norrlini* proposuimus.

b. *Thallostelides* Vain.

Thallus primarius squamis majoribus minoribusve, subtus albis. Podetia bene evoluta (varietatibus descendens exceptis), saepissime sterilia, scyphifera aut ascypha, glau-

cescentia albidave aut fusciescentia, parietibus tenuioribus, integris aut subintegris, cavitate lata. Apothecia fusca aut atypice pallida.

30. *Cl. gracilis* (L.) Willd.

Fl. Berol. (1787) p. 363; Vain. l. c. II p. 81, 87, 462, III p. 250.
Lichen gracilis L. Spec. Plant. (1753) p. 1152 p. p.

Podetia demum elongata, scyphifera aut p. p. ascypha, margine scyphorum prolifera, tota aut majore parte corticata, esorediata (aut rarissime parce granulosa), haud tomentosa, KHO minus distincte aut haud lutescentia, acidum atranoricum non continentia, partibus emorientibus haud maculatis.

Distr. Ad terram humosam muscosque locis apricis subumbrosisve aut silvosis supra rupes saxaque, rarius ad truncos putridos et terram arenosam humosamve in campis et silvis siccis crescit et frequens toto territorio.

Var. *dilatata* (Hoffm.) Vain.

l. c. II p. 87, 90, III p. 250. *Cladonia dilatata* Hoffm. Deutschl. Fl. (1796) p. 126. *Cl. gracilis* γ. *hybrida* Tuck. Syn. Lich. New Engl. (1848) p. 49 (haud Hoffm.).

Exs. Sommerf. Plant. Crypt. Norv. I (1826) n. 75. — Stenh. Lich. Suec. Exs. n. 188 (sec. Th. Fr. Lich. Scand. p. 82). — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 61, 62, cont. (1921) n. 683.

Podetia semper scyphifera, scyphis comparate dilatatis, subregularibus, pede brevior, sat crasso, apicibus sterilibus scyphiferis, squamis destituta.

Distr. In Pietsuvaara in LENont. (sec. Norrl. Ber. Torn. Lappm. p. 319), Liehkvär ad Kopustjärn in Llm. (A. O. Kairamo), sat frequenter adhuc in Lapponia Kemensi et obviam in reg. subalpina in Kuusamo (Vain. Adj. Lich. Lapp. I p. 106), meridiem versus toto territorio frequenter.

Thallus primarius persistens aut demum evanescens, squamis 2—5, raro —10 mm longis (rarissime adhuc majoribus), 0.300—0.120 mm crassis. Podetia e lamina thalli primarii enata, long. circ. 20—80 mm, crass. 1—2.5 (0.3—4) mm, tubaeformia aut repetito-tubaeformia, glaucescentia aut testaceo-pallida aut testaceo-fusciescentia, scyphis 3—10 mm latis, regularibus aut subregularibus, tabulatis inferioribus 20—30 (rarius 12—50) mm altis, apicibus sterilibus scypho evoluti aut rarius subabor-

tivo terminatis, partibus junioribus apicalibusve KHO dilute lutescentibus flavescentibusve, apice haud diu aut proliferationibus sat diu accrescentia, parietibus circ. 0.280—0.120 mm crassis. Stratum chondroideum indistincte limitatum. Apothecia lat. 4—1 (0.8—8) mm, convexa immarginataque aut raro tenuissime marginata. Conidangia in margine scyphorum saepe numerosa, sessilia, ovoidea aut mamillaeformia, crass. 0.250—0.550 mm, basi haud aut bene constricta, fusconigra aut fusciscentia aut basi pallida. Conidia cylindrica aut subfusiformi-cylindrica, leviter curvata aut parcius rectiuscula, long. 0.007—0.005, crass. circ. 0.0005 mm.

Obs. *F. subprolifera* Vain. l. c. II p. 93, III p. 250. Podetia esquamulosa, scyphis regularibus, apicibus ramisque nonnullorum podetiorum subulatis, pede haud elongato. Paucis locis collecta. — *F. anthocephala* Floerk. Clad. Comm. (1828) p. 37 (*icon.* in Arn. Lich. Exs., 1889, n. 1489), Vain. l. c. II p. 96, III p. 251. Podetiis (praesertimque scyphis fertilibus) bene squamosis, apicibus sterilibus scyphiferis. Passim provenit. — *F. mesotheta* (Wallr.) Vain. (*Patellaria fusca* g. *turbinata* B. *tubaeformis* †† *prolifer* f. m. *mesothetum* Wallr. Naturg. Säulch.-Flecht., 1829, p. 125, conf. Arn. Lich. Fragm. XXX, 1891, tab. I f. 4, 5, Vain. l. c. II p. 92), podetiis e centro diaphragmateve scyphorum proliferationem unam alteramve emittentibus. Paucis locis collecta. — *F. dilacerata* Floerk. Clad. Comm. (1828) p. 37 (*icon.* in Arn. Lich. Exs., 1889, n. 1488), Vain. l. c. II p. 93, 95, III p. 251 (*exs.*: Rehm Clad. Exs., 1883, n. 327, 1892, n. 423, Norrl. et Nyl. Herb. Lich. Fenn. cont., 1921, n. 685, 686, 687), podetiis vulgo crassis crassiusculisve, squamosis, scyphis saltem p. p. irregularibus, apicibus sterilibus scyphiferis, pede brevior. Locis numerosis collecta.

Var. *chordalis* (Floerk.) Schaer.

Lich. Helv. Spic. (1823) p. 32, Vain. l. c. II p. 97, 104, III p. 251. *Capitularia gracilis* B. Cap. (*chordalis*) Floerk. Besch. Braunfr. Becherfl. (1810) p. 324 p. p.

Exs. Sommerf. Plant. Crypt. Norv. II (1836) n. 160 (sec. Th. Fr. Lich. Scand. p. 160. — Fellm. Lich. Arct. (1864) n. 30. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 63, (1882) n. 421. — Havaas Lich. Exs. Norv. I (1901) n. 72. — Malme Lich. Suec. Exs. XXI (1915) n. 514. — Zahlbr. Krypt. Exs. Vindob. XXIV (1916) n. 2357 („f. *pleurocarpa* Sandst.“).

Podetia sat gracilia, subulata aut scyphifera et ramis saltem p. p. subulatis, squamis destituta, testaceo-fusciscentia aut olivaceo-glauescentia, scyphis angustis, regularibus aut partim irregularibus, pede vulgo elongato.

Distr. Supra muscos et ad terram humosam in rupibus et saxis locis apricis aut rarius locis umbrosis et in silvis, raro etiam ad terram arenosam crescit. In Lapponia pluribus locis obvia (Nyl. Lich. Lapp. Or. p. 109, Norrl. Ber. Torn. Lappm. p. 319, Vain. Adj. Lich. Lapp. I p. 106, Kihlm. Flecht. Kola p. 46), ceterum sat frequenter in territorio.

Thallus primarius vulgo demum evanescens. Podetia vulgo basi emorientia et apice proliferationibus ramisve simul diu accrescentia, long. circ. 30—80 (15—140), crass. 0.5—1 mm, p. p. rarius —2 mm, simplicia aut saepe parce monopodialiter ramosa aut proliferationibus e scyphis subdichotome ramosa, scyphis 2—4, raro —7 mm latis, tabulatis inferioribus 40—30 (rarius 70—20) mm altis, acidum fumar-protocetraricum 0.75 % continentia, quod in KHO colore luteo (demum obscuriore) et in H₂SO₄ concentr. colore rubricoso solvitur et in spiritu vini cum ClH aut H₂SO₄ decoctum corpusculum aeruginosum producit (sec. Zopf Flechtenst. p. 174, Beitr. Chem. Mon. Clad. p. 77). Gonidia ad Cystococcum glomeratum (sec. Warén Reinkult. Flechtengon. p. 56, 64) pertinentia.

Obs. F. *platydactyla* (Wallr.) Vain. l. c. II p. 97, 110, III p. 251 (*Patellaria fusca* g. *turbinata* B. *tubaeformis* †† prolifer d. m. *platydactylum* Wallr. Naturg. Säulch.-Flecht., 1829, p. 126). Exs.: Zwackh Lich. Exs. (1891) n. 1103. Icon.: Arn. Lich. Exs. (1888) n. 1297, (1890) n. 1494 dextr. (3 pod.). Podetia scyphis irregularibus, squamis destituta. E v. *chordali* evoluta est. Rara in Fennia. — F. *leucochlora* Floerk. [Vain. l. c. II p. 105, III p. 251, *Capitularia gracilis* β. *hybrida* (*leucochlora*) Floerk. Besch. Braunfr. Becherfl., 1810, p. 328, Krit. Lich. Ach., 1810, p. 258], podetiis albido-glauescentibus a v. *chordali* differens, etiam in Fennia provenit et v. *chordalem* cum **Cl. elongata* connectit. — F. *aspera* Floerk. Clad. Comm. (1828) p. 40; Vain. l. c. II p. 110, III p. 251 (*Cap. gracilis* δ. *Cap. aspera* Floerk. in Web. Beitr. Naturk. II, 1810, p. 259, 333). Exs.: Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 65 (64), (1882) n. 423, cont. (1921) n. 688—692. Podetiis squamosis, glaucescentibus aut testaceis fuscescentibusve a v. *chordali* differt. In provinciis australibus et mediis est sat frequens, septentrionem versus rarescens. Typica non est collecta in Lapponia. In v. *chordalem* saepe transit.

Var. *gracillima* (Norrl.) Vain.

l. c. II p. 115, III p. 251. *Cl. gracilis* **gracillima* Norrl. in Herb. Lich. Fenn. IX (1882) p. 424.

Exs. Norrl. et Nyl. l. c., cont. (1921) n. 682.

Podetia *gracillima*, subulata aut scyphifera et ramis saltem p. p. subulatis, squamis destituta.

Distr. Supra muscos et plantas destructas in rupe in insula parva prope Vaania in Hollola Tavastiae austr. (J. P. Norrlin, postea Vain.).

Podetia apice vulgo proliferationibus diu accrescentia et simul basi emorientia, long. circ. 50—10, crass. 0.25—0.5 mm, scyphis 2—0.8 mm latis, subregularibus aut demum plus minus irregularibus obliquisve, margine denticulato radiatove, tabulatis 1—3, inferioribus 10—30 mm altis, parte superiore testacea vel testaceo-fuscescentia vel testaceo-pallida, basin versus pallidiora albidave, partibus junioribus KHO dilutissime flavescientia aut haud distincte reagentia. Cum *Cl. pityrea* facile commiscitur, sed podetiis magis laevigatis et strato chondroideo indistincte limitato ab ea differens.

Obs. *F. subgracillima* Vain. Apicibus ramorum vulgo scyphiferis, tantum parcellissime subulatis a v. *gracillima* differt. Item *Cl. pityreae* est subsimilis, sed in v. *dilatata* transire videtur. Podetia long. 15—25, crass. 0.3—0.6 mm, scyphis 2—5 mm latis, margine radiatis, tabulato infimo 7—10 mm alto, KHO haud distincte reagentia. Supra terram humosam ad Perkjärvi in Muola in Isthmo Kar. (A. O. Kairamo).

31. **Cl. elongata* (Jacq.) Hoffm.

Cl. elongata Hoffm. Deutschl. Fl. (1796) p. 119. *Lichen elongatus* Jacq. Misc. II (1781) p. 368, tab. 11 f. 1. *Cl. gracilis* β . *macroceras* b. *elongata* Floerk. Clad. Comm. (1828) p. 38. *Cl. gracilis* η . *elongata* Vain. l. c. II p. 116, 120, III p. 251. *Capitularia gracilis* γ . *Cap. macroceras* Floerk. Besch. Breunfr. Becherfl. (1810) p. 330. *Cl. gracilis* f. *exoncera* (Ach.) Nyl. Lich. Lapp. Or. (1866) p. 109. *Cl. ecmocyna* (Ach.) Nyl. l. c. p. 176; Norrl. Ber. Torn. Lappm. (1873) p. 319.

Exs. Nyl. Lich. Mont-Dor. (1856) n. 6. — Fellm. Lich. Arct. (1864) n. 28, 29. — Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 425. — Havaas Lich. Exs. Norv. (1901) n. 73. — Malme Lich. Suec. Exs. XX (1915) n. 478.

Podetia *elongata*, saltem p. p. crassiuscula, subulata ascyphaeque aut scyphifera et ramis saltem p. p. subulatis, cortice continuo aut areolato laevigatoque, scyphis comparate angustis, tabulato infimo elongato, haud sorediosa, squamis vulgo destituta, acidum atranoricum continentia et KHO lutescentia.

Distr. Ad terram humosam vel rarius arenosam aut supra muscos praecipue in rupibus et saxis locis subhumidis ventosisque apricis aut rarius subumbrosis et in

tundris crescit. LIn.: Frequenter in littoribus fluminis Paatsjoki in reg. pinifera (Vain. Adj. Lich. Lapp. I p. 106), Väylä (R. Hult). In reg. betulina et alpina ad Kilpisjärvi atque Leutsuvaara in LEnont., et frequenter in reg. coniferarum in territorio Lapponiae a Norrl. explorato (Norrl. Ber. Torn. Lappm. p. 319), et specimina adsunt e Pahtarinne, Keimioniemi et Muonio in LKem., ubi etiam ad Venejoki et Isovaara in Kittilä (G. Lång) et in Pyhätunturi in Kemijärvi (M. E. Huuonen) collecta est. LTul.: Nuortjavr (H. Hollmén), Vaidoguba et Sredinj (F. W. Klingstedt), ad Sin. Kuollaänsem (N. I. Fellman). LMur.: Voroninsk (A. O. Kairamo). LIm.: Imandra et Kantalahti (H. Hollmén). LPon.: Svetoinos (Fellm. l. c. n. 28), Panfelofka (Fellm. l. c. n. 29), Orlov (A. O. Kairamo). KKER.: In reg. subalp. montis Kivakka (Vain. l. c.). Kuus.: In reg. subalp. montis Iivaara et in reg. abietina montis Näränkävaara (Vain. l. c.). OKaj.: In saxeto humido ad Lehtovaara in Kianta (Vain. l. c.). KOn.: Perttiniemi (Th. Simming), Rasnavolok (P. A. Karsten). Ta.: Evo (Norrl. H. L. F. n. 425 b). Al.: Ytternäs in Jomala et Grelsberg in Finström (F. W. Klingstedt).

Thallus primarius demum evanescens. Podetia basi demum emorientia et apice simul proliferationibus ramisve diu aut sat diu accrescentia, long. circ. 50—100 (20—140), crass. 1—2.5, rarius 0.8—5 mm, subsimplicia aut saepe parcius (raro sat abundanter) monopodialiter ramosa, cylindrica aut tubaeformia, scyphis angustis, 2—6, raro —12 mm latis, regularibus aut rarius demum plus minus obliquis, tabulatis inferioribus vulgo circ. 40—80 (—30) mm altis, glaucescentia aut albedo- vel pallido- vel olivaceo-glaucescentia aut testaceo-pallida vel testaceo-fuscescentia aut parte superiore obscuriora, partibus junioribus KHO dilute flavescentia aut distincte lutescentia, addito hypochlorite calcico dilute subrufescentia aut sordide subfulvescentia, sec. Zopf (Flechtenst. p. 407, Beitr. Chem. Mon. Clad. p. 78) acicum atranoricum (0.3 %) et fumar-protocetraricum (0.8 %) continentia. — Ob notam chemicam haec subspecies a *Cl. gracili* distinguitur, sed in eam transire videtur.

Obs. *F. ecmocyna* (Ach.) Vain. (l. c. II p. 125, III p. 251), podetiis glaucescentibus instructa, in territorio nostro abundanter collecta est. — *F. laontera* (Del.) Vain. (*Cl. gracilis* f. *laontera* Del. in herb., Arn. in Rehm Clad. Exs., 1885, n. 261, Arn. Lich. Tirol XXIII, 1887, p. 107,

Vain. l. c. II p. 126, III p. 251), podetiis squamosis, ascyphis aut scyphis regularibus instructis, in Lapponia collecta, rara est. Huc etiam Zwackh Lich. Exs. (1888) n. 1012 p. p. pertinet (p. p. ad f. *ecmocynam*).

32. *Cl. cornuta* (L.) Schaer.

Lich. Helv. Spic. VI (1833) p. 299; Vain. l. c. II p. 127, III p. 251. *Lichen cornutus* L. Spec. Plant. (1753) p. 1152 n. 63 p. p. (conf. Vain. l. c. II p. 133, Rev. Lich. Linn., 1886, p. 8).

Exs. Floerk. Deutsch. Lich. VII (1821) n. 139. — Fr. Lich. Suec. Exs. V (1824) n. 116. — Floerk. Clad. Exs. III (1829) n. 56, 57. — Nyl. Lich. Mont-Dor. (1856) n. 5. — Stenh. Lich. Suec. Exs. n. 191 (sec. Th. Fr. Lich. Scand. p. 82). — Fellm. Lich. Arct. (1864) n. 31. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 66, IX (1882) n. 426, 427, cont. (1921) n. 693, 694. — Havaas Lich. Exs. Norv. (1902) n. 95. — Malme Lich. Suec. Exs. XXII (1915) n. 530.

Podetia elongata, vulgo *crassiuscula*, partim *ascypha*, partim *scyphifera*, *scyphis angustis*, maxima parte *corticata*, *apicem versus sorediosa*, vulgo *squamis destituta*.

Distr. Ad terram humosam et muscos supra saxa rupesque locis subumbrosis silvosisve aut apricis et ad terram arenosam humosamve aut muscosam in silvis siccis mixtisve aut in campis et turfosis, saepe etiam ad truncos putridos crescit, frequenter aut sat frequenter toto territorio, etiam in Lapponia, proveniens.

Thallus primarius demum evanescens, squamis 3—8 mm longis, 0.250—0.150 mm crassis, KHO non reagens. *Podetia* e lamina thalli primarii enata, long. 120—20 (—160) mm, crass. 0.8—2.5 (—5) mm, cylindrica aut elongato-tubaeformia, *scyphis* 2—4 (—7) mm latis, sat regularibus aut demum obliquis, proliferationibus vulgo subsolitariis, tabulatis haud numerosis (1—3), inferioribus demum elongatis (100—20 mm altis), simplicia aut raro parce monopodialiter ramosa aut proliferationibus raro radiatis, cortice subcontinuo subareolato, areolis sat parvis aut mediocribus, parum prominentibus, subcontiguis, apice aut dimidia parte superiore cujusque tabulati *sorediosa*, *podetiis* nonnullis totis rarissime esorediosis, glaucescenti-albida aut glauca aut olivacea aut cinerascens vel cinereo-fuscescens, basi demum emorientia et sterilia simul proliferationibus vulgo sat diu accrescentia, apicem versus KHO primo flavescentia deindeque subolivacea, acidum fumar-protocetraricum (1 ⁰/₁₀) continentia sec.

Zopf (Beitr. Chem. Mon. Clad. p. 79), parietibus 0.260—0.120 mm crassis. Stratum chondroideum indistincte limitatum. Apothecia vulgo mediocria, circ. 2—6 (—0.5) mm lata, convexa immarginataque aut interdum primo planiuscula tenuissimeque marginata, fusca aut rarius testacea aut raro pallida. Sporae oblongae aut fusiformi-oblongae aut oblongo-ovoideae, long. 0.008—0.012 (—0.014), crass. 0.0025—0.003 mm. Conidangia ovoidea aut mamillaeformi-ovoidea, crass. 0.260—0.480 mm, basi constricta aut dilatata, fusciscentia. Conidia cylindrico-fusiformia, curvata, long. 0.007—0.005, crass. vix 0.001 mm. Gonidia sec. Warén (Reinkult. Flechtengon. p. 59) ad *Cystococcum glomeratum* var. *minorem* pertinentia.

Obs. *F. phyllotoca* (Floerk.) Arn. Lich. Fränk. Jur. (Fl. 1884) p. 27, Vain. l. c. II p. 133, III p. 251 (*Cl. coniocraea* β . *phyllotoca* Floerk. Clad. Comm., 1828, p. 87, Clad. Exs., 1829, n. 57). *Exs.*: Rabenh. Clad. Eur. (1860) tab. XVI n. xxii 1, Rehm Clad. Exs. I (1869) n. 34. *Podetia squamosa*. Pluribus locis in Fennia collecta. — *F. ochrocarpa* Nyl., Vain. l. c. II p. 135, III p. 251 (*Cl. gracilis* **Cl. cornuta* f. *ochrocarpa* Nyl. in Norrl. Fl. Kar. Oneg. II, 1876, p. 13). *Podetia squamis destituta*, apothecia pallida. Ad Perttiniemi in KOn. (Th. Simming). — *F. obtrusa* Kullh. (Vain. l. c. II p. 135, III p. 251). Apotheciis numerosis, minutis, brevissime stipitatis, fuscis, lateri podetiorum affixis, instructa. Analoga est *Cl. fimbriatae* f. *pycnothelizae* (Nyl.). Ad plantas destructas in Mustiala in Ta. ab A. Kullhem collecta.

33. *Cl. degenerans* (Floerk.) Spreng.

Linn. Syst. Veg. IV (1827) p. 373; Vain. l. c. II p. 135, III p. 257. *Baeomyces degenerans* Floerk. in Berl. Magaz., 1807, p. 283, 285, 290, 292.

Exs. Ehrh. Plant. Crypt. (1793) n. 287. — Fr. Lich. Suec. Exs. III (1818) n. 54. — Floerk. Deutsch. Lich. X (1821) n. 194, Clad. Exs. (1829) n. 16—21. — Stenh. Lich. Suec. Exs. n. 190 (sec. Arn. l. c. p. 27 et 28). — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 70—72, IX (1882) n. 429—431, cont. (1921) n. 695—700. — Havaas Lich. Exs. Norv. (1902) n. 89. — Malme Lich. Suec. Exs. XIX (1915) n. 454.

Thallus primarius squamis vulgo parvis mediocribusve. *Podetia* demum elongata, ascypha aut scyphifera, scyphis vulgo irregularibus, esorediata, areolis corticatis minutis, saltem partim sparsis, inter areolas decorticata et ex hyphis crassis subtomentosa, KHO parum reagentia, basi maculata.

Distr. Ad terram humosam muscosque locis apricis subapricisque in rupibus et saxis, ad terram humosam muscosamque et rarius etiam ad terram nudam arenosam in silvis siccis increbrioribus praesertimque piniferis et in campis apricis crescit. Frequenter aut sat frequenter in partibus australibus territorii provenit, septentrionem versus frequenter adhuc in Karelia bor. et in Kuhmo et Kianta in Ostrobothnia Kajanensi; in reg. silvatica in monte Näränkäväära et ad Paanajärvi et in reg. subalpina montis Iivaara in Kuus. (Vain. Adj. Lich. Lapp. I p. 108), in Simo et Kemi (V. Räsänen) in Ob., ad Soukelo (N. I. Fellman) in KKER., in Pahtarinne et Ounastunturi in LKem. (sec. Norrl. Ber. Torn. Lappm. p. 319). LENont.: Pietsovaara („Cl. trachyna“ Nyl. in Norrl. l. c.), in pineto ad Hetta, Pahtavaara (Norrl.), prope Karesuanto („Cl. furcata f. truncata“ Nyl. in Norrl. l. c.). LIn.: Lapinselänne et Kultala (Vain. l. c.), Tschuolisvuono (A. W. Granit et B. R. Poppius). LIm.: Imandra (H. Holmén), Kopustjavr (A. O. Kairamo). LMur.: Olenji („f. fuscescens“ Nyl. Lich. Lapp. Or. p. 109, lecta a N. I. Fellman).

Thallus primarius demum evanescens, squamis 2—5 (raro—13) mm longis, 0.270—0.150 mm crassis, esorediosis. Podetia e superficie thalli primarii enata, long. 8—80, crass. 0.5—4 mm, scyphis 1.5—10 mm latis, margine proliferis, rarissime partim e centro et margine proliferis, tabulatis inferioribus 0.8—30 mm altis, squamis destituta aut squamosa, opaca, glaucescentia aut albido-glaucescentia aut olivacea aut cinereo-fuscescentia, sec. Zopf (Beitr. Chem. Mon. Clad. p. 86, 101) haud acidum fumarprotocetraricum continentia, apice proliferationibus saepe sat diu accrescentia, partibus emorientibus obscuratis et vulgo albidovel pallido-maculatis, parietibus crass. 0.4—0.2 mm, in superficie inter areolas corticatas hyphis tomentum formantibus crass. 0.009—0.005 mm. Stratum chondroideum indistincte limitatum, crass. circ. 0.050—0.060 mm. Apothecia lat. 0.5—2 (0.3—3) mm, convexa aut primum planiuscula, immarginata, fusca aut raro testacea pallidave. Sporae oblongae aut rarius ovoideae aut fusiformi-oblongae, long. 0.009—0.014, crass. 0.0025—0.0035 mm. Conidangia ovoideo-subglobosa aut ovoidea aut mamillaeformia aut semiglobosa, crass. 0.330—0.190 mm, basi leviter aut rarius bene constricta aut dilatata, fusco-nigricantia aut cinereo-fuscescentia, aut basi cinerascentia.

Conidia fusiformi-cylindrica, leviter aut levissime curvata, long. 0.005—0.010, crass. 0.001 mm.

F. euphorea (Ach.) Floerk. Clad. Comm. (1828) p. 43, Vain. l. c. II p. 141, 144, III p. 257 (*Cenomyce gonorega* b. *euphorea* Ach. Syn. Lich., 1814, p. 259). — **Exs.** Floerk. Clad. Exs. (1829) n. 17, Hepp Flecht. Eur. IV (1867) n. 803, Rabenh. Clad. Eur. (1860) tab. XVI n. xxiv 3, Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 70 a, c, cont. (1921) n. 695, 696 (ad f. *phyllophoram* accedens), Rehm Clad. Exs. III (1879) n. 119 p. p., VI (1886) n. 300 p. p., X (1890) n. 397. Podetia squamulosa aut parte inferiore parcius squamosa, scyphifera, scyphis sterilibus regularibus. Toto territorio.

F. clodomorpha (Ach.) Vain. l. c. II p. 141, 146, III p. 257 (*Baeomyces alcicornis* β . *B. clodomorphus* Ach. Meth. Lich., 1803, p. 350). — **Exs.** Floerk. Clad. Exs. (1829) n. 16, 18, Rabenh. Clad. Eur. (1860) tab. XVII n. xxiv 10—12, tab. XVIII n. xxiv 13, 14 p. p., 15, tab. XIX n. xxv 2, Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 70 b p. p., 72, IX (1882) n. 429 p. p., Zwackh Lich. Exs. (1881) n. 637, 638, (1882) n. 637 bis, Rehm Clad. Exs. VI (1886) n. 303, 304, Arn. Lich. Exs. (1886) n. 1148. Podetia squamulosa aut parte inferiore parcius squamosa, scyphifera, scyphis irregularibus, margine laceratis, saepe demum obsoletis et in radios ramosve divis. Haud rara in provinciis meridionalibus mediisque.

F. dilacerata Schaer., Vain. l. c. II p. 141, 150, III p. 257 (*Cl. degenerans* α . *glabra* *scyphosa* *tubaeformis* *dilacerata* Schaer. Enum. Lich. Eur., 1850, p. 193). — **Exs.** Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 71 p. p., IX (1882) n. 430 p. p., 431, cont. (1921) n. 700, Rehm Clad. Exs. V (1885) n. 265 p. p. Podetia squamulosa aut parte inferiore parcius squamosa, ascypha aut partim parce minuteque scyphifera, irregulariter ramosa, ramis cornutis aut subulatis. Praesertim in provinciis meridionalibus mediisque provenit.

F. phyllophora (Ehrh.) Flot. Lich. Fl. Siles. (1849) p. 32, Vain. l. c. II p. 141, 151, III p. 257 p. p. — **Exs.** Ehrh. Plant. Crypt. (1793) n. 287, Clad. Exs. n. 19, Rabenh. Clad. Eur. Supl. (1863) n. XVIII n. 20, 21, 26, Zwackh Lich. Exs. (1882) n. 687, Rehm Clad. Exs. (1886) n. 300 p. p., 301, Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 697. Podetia bene squamosa, scyphifera. Haud rara in provinciis meridionalibus mediisque. — Ab hac f. *euphorea squamifera* vix distinguenda est.

F. polypaea (Ach.) Vain. (*Cenomyce genorega* h. *polypaea* Ach. Syn. Lich., 1814, p. 260, conf. Vain. l. c. II p. 154). — **Exs.** Rehm Clad. Exs. III (1879) n. 116 p. p., 120, Zwackh Lich. Exs. (1882) n. 688 p. p., Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 698. Podetia bene squamosa, ascypha. Podetiis squamosis a f. *dilacerata* differt. Passim in provinciis meridionalibus et mediis obvenit.

34. *Cl. gracilescens* (Floerk.) Vain.

Adj. Lich. Lapp. I (1881) p. 107, Mon. Clad. Univ. II (1894) p. 159, 164, III (1897) p. 250; Hue Lich. Extra-Eur. (1898) p. 61 n. 105; Scriba Clad. Korea (Hedwigia LIII) p. 176 p. p.; Lynge Norske Busk-Bladlav. (1910) p. 40, Stud. Lich. Norw. (1921) p. 71. *Capitularia degenerans* O. C. (*gracilescens*) Floerk. Besch. Braunfr. Becherfl. (1810) p. 321. *Cenomyce gonorega* m. *gracilescens* Ach. Syn. Lich. (1814) p. 260. *Cl. degenerans* var. *lepidota* Nyl. Herb. Mus. Fenn. (1859) p. 79 (nec Schleich., nec Ach.). *Cl. lepidota* Nyl. Lich. Lapp. Or. (1866) p. 176, Fl. 1866 p. 421.

Exs. Floerk. Deutsch. Lich. VI (1819) n. 111 (in mus. Berol.). — Fellm. Lich. Lapp. Or. (1864) n. 35 (sec. Nyl. l. c. p. 109 et 176). — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 73. — Rehm Clad. Exs. II (1875) n. 69, 70. — Zwackh Lich. Exs. (1883) n. 744. — Havaas Lich. Exs. Norv. (1902) n. 97. — Zahlbr. Krypt. Exs. Vindob. XIX (1911) n. 1867.

Thallus primarius demum evanescens, squamis vulgo mediocribus. Podetia demum elongata, scyphifera, e centro scyphorum repetito-prolifera, apicibus scyphiferis aut proboscideis aut partim parcius ascyphis, cortice partim subcontinuo, partim areolato, areolis minutis, dispersis aut subcontiguis, inter areolas ex hyphis crassis saepe subtomentosa, esorediata, vulgo squamosa, KHO lutescentia, basi partim maculata.

Distr. Locis humidis apricis supra rupes et saxa, ad ipsam rupem et plantas destructas crescit. N.: Hoglandia (E. Nylander). Ta.: Judinsalo in Luhanka (Vain. Fl. Tav. Or. p. 95). OKaj.: Lehtovaara in Kianta (Vain. Adj. Lich. Lapp. I p. 107). LKem.: Ad flumen Lainio et in monte Isovaara in Kittilä (G. Lång). LENont.: In reg. pinifera et betulina sat frequenter, in reg. alpina montium Olostunturi et Pietsovaara (Norrl. Ber. Torn. Lappm. p. 320), in reg. subalpina in Virkakursu in Kaaresuanto (G. Lång, Zahlbr. l. c.). LIn.: Ex jugo Suoloselkä septentrionem versus frequenter in reg. coniferarum mixtarum, pinifera, betulina, subalpina usque ad Mare Glaciale (Vain. l. c.). Frequenter in Lapponia Kuollaënsi, velut ad Gavrilova et Voroninsk in LMur. et Lovosersk in LIm. (Kihlm. Neu. Beitr. Flecht. Kola p. 46), specimina adsunt etiam e Kopustjavr, Ump-

javr (A. O. Kairamo) et Kantalahti (G. Selin). In LPon.: Svaetoinos (Fellm. l. c. n. 35, sec. Nyl. Lich. Lapp. Or. p. 109).

Thallus primarius squamis long. 2—20 mm. Podetia e lamina thalli enata, long. circ. 60—110 (20—190), crass. 0.8—1.5 (0.5—2) mm, scyphis 5—2 mm latis, tabulatis vigentibus circ. 2—4, cum mortuis adhuc adhaerentibus —7, tabulatis inferioribus circ. 20—15 (—10) mm altis, cavitate scyphorum haud profunda, apicibus bene aut minute scyphiferis proboscideisque aut partim parciusque etiam ascyphis cornutisque, vulgo crebre constipata et caespites latos formantia, areolis corticis vulgo 0.8—0.5 mm latis, partibus decorticatis haud latis, basi emorientia et simul apice proliferationibus diutissime accrescentia, parietibus 0.120—0.220 mm crassis. Stratum chondroideum indistincte limitatum. Apothecia parva aut p. p. mediocria, lat. 0.6—1.5 mm, basi leviter subpeltato-constricta, convexa aut primum planiuscula, primum vulgo tenuissime marginata, fusca aut fusco-rufescentia. Sporae fusiformi-oblongae aut oblongae, long. 0.009—0.015, crass. 0.0025—0.0035 mm. Conidangia mamillaeformia aut ovoidea aut subglobosa vel depresso-subglobosa, crass. 0.2—0.4 mm, basi leviter aut rarius haud constricta, fusco-nigricantia aut cinerascientia. Conidia subfusiformi-cylindrica aut fere cylindrica, sat leviter aut parcius bene curvata, long. 0.007—0.010 mm.

F. **nudior** Vain. Podetia squamis vix ullis aut parcissimis, basi late emorientia et apice simul diu accrescentia. In uliginosis ad Kopustjavr in Lapponia Imandrensi (A. O. Kairamo). — *Cl. degenerans* f. *aphylla* Nyl., Syn. Lich. p. 200, Lich. Exot. (1859) p. 249 (Vain. l. c. II p. 165), podetiis multo minoribus tenuioribusque, KHO rubescentibus, nec lutescentibus, apice haud diu accrescentibus, areolis corticis 0.2—0.15 mm latis, subverrucaeformibus, subcontiguis, apicibus scyphiferis aut proboscideis, thallo primario subpersistente, mediocri (sec. specim. orig. in herb. Nyl.) ab hac specie differt et nominetur *Cl. aphylla* (Nyl.) Vain.

35. *Cl. cerasphora* Vain.

l. c. II p. 167, III p. 257. *Cl. lepidota* Arn. in Rehm Clad. Exs. III (1879) n. 121, V (1885) n. 266 (haud Ach.). *Cl. gracilescens* var. *cerasphora* Lynge in Zahlbr. Krypt. Exs. Vindob. n. 2455.

Thallus primarius persistens aut demum evanescens, squamis mediocribus aut majoribus. Podetia brevia aut elongata, ascypha, cortice partim subcontinuo, partim areo-

lato, inter areolas corticatas, haud late dispersas, parce sub-tomentosa, esorediata, squamosa aut squamosa, KHO lutescentia, basi demum maculata.

Distr. In turfosis ad Gavrilova in LMur. et in tundra prope Orlov (A. O. Kairamo, „Cl. lepidota“ sec. determ. Nyl. in Kihlm. Neue Beitr. Flecht. Kola p. 46) in LPon. In Lapponia sine ind. loci in mus. Fenn. (E. Nylander).

Thallus primarius squamis circ. 5—12 mm longis latisque, KHO superne et inferne leviter lutescentibus. Podetia e lamina thalli primarii enata, long. 5—100, crass. 1—1.5 (0.4—3) mm, cylindrica, apicibus obtusis aut subulatis, subsimplicia aut dichotome aut irregulariter ramosa, crebre constipata aut aggregata, areolis corticis circ. 0.8—0.3 mm latis, partibus decorticatis haud latis, albido-glauescentia aut cinereo-testacea fuscescientiae, basi emorientia et apicibus simul vulgo diu accrescentia, parietibus crass. 0.20—0.16 mm. Stratum chondroideum indistincte limitatum. Conidangia ovoidea aut mamillaeformi-ovoidea aut subglobosa, crass. 0.36—0.50 mm, basi leviter constricta, fusca aut cinereo-fuscescientia. Conidangia fusiformi-cylindrica aut fere cylindrica, leviter curvata, long. 0.010—0.007, crass. vix 0.001 mm.

F. stricta (Nyl.) Vain. l. c. II p. 169, 170, III p. 257 [*Cl. degenerans* var. *stricta* Nyl. Lich. Middendorff. (ed. sep. 1867 p. 4), 1874 p. LVIII, sec. specim. in mus. Brit. et herb. Nyl., *Cl. stricta* Nyl. Fl. 1869 p. 294 sec. specim. e Skaddavaara ad Alten in Norvegia in herb. Nyl., haud *Cl. lepidota* **Cl. stricta* Nyl. in Norrl. Ber. Torn. Lappm., 1873, p. 320]. Thallus primarius demum evanescens. Podetia squamis destituta. Ad Orlov in LPon. (A. O. Kairamo).

F. pterophora Vain. l. c. II p. 169, III p. 257. — Exs. Rehm Clad. Exs. n. 121, 266. Thallus primarius demum evanescens. Podetia squamosa. Ad Gavrilova in LMur. (A. O. Kairamo).

F. hypophylla (Nyl.) Vain. l. c. II p. 170, III p. 257 (*Cl. degenerans* f. *hypophylla* Nyl. Lich. Scand., 1861, p. 54). Thallus primarius persistens aut demum evanescens et squamis novis renovatus. Podetia brevissima. In Lapponia (E. Nylander). In Rossia lecta ab Hassal sec. specim. in herb. Nyl.

36. *Cl. verticillata* Hoffm.

Schaer. Lich. Helv. Spic. (1823) p. 31; Vain. l. c. II p. 176, III p. 258. *Cl. pyxidata* **C. verticillata* Hoffm. Deutschl. Fl. II (1796) p. 122. *Cl. subverticillata* Nyl. Lich. Jap. (1890) p. 20.

Thallus primarius squamis minoribus majusculisve. Podetia brevia aut proliferationibus demum sat elongata, scyphifera (aut raro ascypha), e centro scyphorum prolifera, tabulatis 1—6, corticata, cortice subcontinuo aut areolis corticatis subcontiguïs, esorediata, typice haud squamosa, KHO non reagentia, basi haud maculata.

Distr. Ad terram arenosam in campis apricis sterilibusque et ad detritum supra rupes, rarius ad muscos destructos in rupibus saxisque et ad terram turfosam crescit. In Lapponia pluribus locis lecta, in Ostrobotnia Kajanensi et in provinciis meridiem versus sitis est sat frequens.

Thallus primarius persistens aut demum evanescens, KHO non reagens. Podetia e lamina et margine laterali thalli enata, long. circ. 4—50, crass. 0.3—3 mm, scyphis 2—9 mm latis, vulgo sat regularibus, cavitate scyphorum haud profunda, tabulatis inferioribus —20 mm altis, olivaceo- aut testaceo- aut albedo-glaucescentia testaceave, KHO haud distincte reagentia, apicibus haud diu accrescentibus, parietibus 0.170—0.270 mm crassis, sec. Zopf (Beitr. Chem. Mon. Clad. p. 83, 84, 101) acidum fumar-protocetraricum ($1-\frac{3}{4}\frac{0}{0}$) continentia (raro ascypha et brevissima, in f. abortiva). Stratum chondroideum irregulariter limitatum. Apothecia lat. 0.5—1.5 (raro —3) mm, inferne constricta subpeltataque aut fere usque ad marginem suffulta, primo planiuscula tenuissimeque marginata, fusca (aut raro testaceo-rufescentia pallidave), sec. Zopf (l. c. p. 84 et 101) saltem in f. *cervicorni* acidum cervicornicum continentia, quod in NaHO solutionem praebet luteo-rufescentem, in H₂SO₄ solutionem rubricoso-rufescentem. Sporae oblongae aut rarius ovoideo-oblongae, long. 0.007—0.016, crass. 0.002—0.003 mm. Conidia subglobosa aut subgloboso-ovoidea, crass. 0.400—0.220 mm, basi haud aut leviter constricta, nigricantia aut fusconigra. Conidia cylindrica aut fusiformi-cylindrica, long. 0.005—0.008 mm, sat bene aut leviter curvata.

F. evoluta Th. Fr.; Stein Flecht. Schles. (1879) p. 49; Vain. l. c. II p. 177, III p. 258. *Cl. gracilis* **Cl. verticillata* *a. evoluta* Th. Fr. Lich. Scand. (1871) p. 83. — Exs. Fr. Lich. Suec. Exs. VIII (1826) n. 234 A. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 67. — Malme Lich. Suec. Exs. XIX (1915) n. 455, XXII (1915) n. 531. — Thallus primarius squamis vulgo minoribus, circ. 2—8 mm longis. Podetia longiora, scyphifera, tabulatis pluribus (demum —6). — **Distr.** LIn.: Ad Paatsjoki in

reg. pinifera (Vain. Adj. Lich. Lapp. I p. 107, etiam A. W. Granit et B. R. Poppius). LIm.: Ad Imandra (N. I. Fellman), in reg. silv. sup. ad Lujavr-urt, Kopustjavr (A. O. Kairamo). LMur.: Lovosersk (Kairamo). Ob.: Simo (V. Räsänen), Louppio ad Tornio in Suecia (Hellb. Norrl. Lafv. 68). Kuus.: Ad Paanajärvi et Näränkåvaara et in reg. subalpina montis Iivaara (Vain. l. c. p. 107). In provinciis magis meridionalibus territorii frequenter.

Obs. *F. phyllocephala* Flot.; Oliv. Etud. Clad. (1885) p. 242; Vain. l. c. III p. 258 (II p. 185). *Cl. cervicornis* β . *verticillata* β *a. dilatata* 1. *phyllocephala* Flot. Lich. Fl. Siles. (1849) p. 31. Podetia squamosa. Locis numerosis collecta. Etiam in Lapponia Kemensi (E. Nylander). — *F. apoticta* (Ach.) Vain. l. c. II p. 184, III p. 258. *Baeomyces pyxidatus* φ . *B. apotictus* Ach. Meth. Lich. (1803) p. 338. Podetia e margine et centro podetiorum scyphifera. Nonnullis locis in Fennia. Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 701 est haec forma in *f. cervicornem* accedens.

F. cervicornis (Ach.) Floerk. Clad. Comm. (1828) p. 29; Vain. l. c. II p. 187, III p. 258. *Lichen cervicornis* Ach. Lich. Suec. Prodr. (1798) p. 184. *Cl. cladomorpha* d. *sobolifera* Del. in Dub. Bot. Gall. (1830) p. 631. *Cl. gracilis* **Cl. sobolifera* Nyl. Fl., 1866, p. 421. *Cl. subverticillata* **Cl. sobolifera* Nyl. Lich. Jap. (1890) p. 20. — Exs. Leight. Lich. Brit. Exs. I (1851) n. 14. — Coem. Clad. Belg. I (1863) n. 14, 15. — Rehm Clad. Exs. II (1875) n. 71 p. p., XI (1892) n. 419. — Lojka Lich. Univ. (1886) n. 209. — Zwaekh Lich. Exs. (1888) n. 1011. — Havaas Lich. Exs. Norv. (1911) n. 406. — Zahlbr. Krypt. Exs. Vindob. XVIII (1911) n. 1772 a, b, c, e. — Thallus primarius squamis p. p. majoribus longioribusve, 5–12 (2–20) mm longis, saepe caespitoso-confertis. Podetia breviora, long. circ. 2–20 mm, scyphifera, scyphis vulgo angustioribus, simplicia aut tabulalatis paucis (1–3) prolifera, tabulato infimo brevi aut sat brevi (circ. 3–15 mm). — **Distr.** Lapponia Enontekiensis: In reg. inf. alpina montis Pietsovaara et in reg. betulina ad Kelottijärvi (Norrl. Ber. Torn. Lappm. p. 319, „**Cl. sobolifera*“), ad Hetta (Norrl., n. 39546 in herb. Nyl.). LKem.: Kätkesuanto in Muonio. Lapponia Kuollaënsis (Fr. Nylander). Kuus.: In reg. subalpina montis Nuorunen (Vain.). OKaj.: Kajaani (K. P. Malmgren). In provinciis magis meridionalibus passim provenit.

**Cl. Krempelhuberi* Vain.

Cl. verticillata β . *Krempelhuberi* Vain. Mon. Clad. Univ. II (1894) p. 187, III (1898) p. 259. *Cl. cervicornis* **Cl. verticillata* Nyl. Lich. Jap. (1890) p. 20. *Cl. verticillata* Hue Lich. Exot. (1892) p. 315 (haud Hoffm.).

Thallus primarius squamaeque KHO superne et inferne dilute lutescentes. Podetia KHO dilute lutescentia aut cortice demum partim rufescente, sec. Zopf in var. *subcervicorni* Vain. (Ann. d. Chem. 352 p. 36, Flechtenstoff. p. 407, Beitr. Chem. Mon. Clad. p. 85, 101) acidum fumar-protocetraricum (1 $\frac{0}{10}$) et atranoricum („etwas“) continentia. Apothecia sec. Zopf (l. c.) continent materiam rufescentem amorpham, cervicorninum. Ceterum similis est *Cl. verticillatae* Hoffm. et in Fennia nondum collecta. — Analoga *Cl. verticillatae* f. *cervicorni* (Ach.) Floerk. est var. *subcervicornis* Vain. (*Cl. verticillata* f. *subcervicornis* Vain. l. c. II p. 197, III p. 259, Lyng. Stud. Lich. Norw., 1921, p. 74, *Cl. subcervicornis* Zopf Flechtenstoff. p. 173, 407, „*Cl. macrophyllodes* Nyl.“ in Zwackh Lich. Exs., 1894, n. 1147, Lyng. Stud. Lich. Norw., 1921, p. 73). Diversa est primaria *Cl. macrophyllodes* Nyl. Fl., 1875, p. 447, Vain. l. c. II p. 165, Lojka Lich. Hung. (1882) n. 14, Rehm Clad. Exs. (1885) n. 277.

37. *Cl. pyxidata* (L.) Fr.

Nov. Sched. Crit. (1826) p. 21; Hoffm. Deutschl. Fl. II (1796) p. 121 (excl. var. p. p.); Vain. l. c. II p. 209, 215, III p. 252. *Lichen pyxidatus* L. Spec. Plant. II (1753) p. 1151 n. 59 p. p.

Thallus primarius squamis mediocribus minoribusve aut raro majusculis. Podetia e lamina thalli primarii enata, breviter aut saltem tabulatis brevibus, scyphifera, scyphis vulgo latis, regularibus, vulgo e parte inferiore sensim dilatatis, cortice verrucoso verruculose aut areolato aut partim praesertimque basin versus subcontinuo, parte superiore inter verrucas plus minus decorticata, esorediata, typice esquamulosa, KHO haud distincte reagentia, acidum fumar-protocetraricum continentia, parietibus crassiusculis. Apothecia fusca aut raro pallida.

Distr. Supra muscos et terram in rupibus et saxis locis siccis aut rarius locis subhumidis, apertis aut silvosis, nec non ad terram nudam arenosam aut humosam muscosamve et ad tecta vetusta lignea crescit. In Lapponia haud rara sec. annot. meas et pluribus locis collecta. Ceterum frequens — sat frequens toto territorio.

Thallus primarius squamis circ. 2—7 (—15) mm longis latisque, 0.600—0.240 mm crassis, marginem versus adhuc tenuioribus. Podetia long. circ. 4—40 (—70), crass. 2.5—0.4 mm, tabulatis 1—3, raro —5, tabulato infimo circ. 4—25 mm alto, cortice glaucescente aut

olivaceo- vel cinereo- vel pallido-glauescente aut raro albido, sec. Zopf (Beitr. Chem. Mon. Clad. p. 81, 101) acidum fumar-protocetraricum (circ. 1 %) continentia, parietibus 0.3—0.15 (0.1) mm crassis. Stratum chondroideum indistincte limitatum. Apothecia lat. 0.5—8 mm, usque ad marginem suffulta aut rarius infra marginem leviter constricta subpeltataque, vulgo convexa immarginataque, fusca aut rarius rufescentia pallidiorave. Sporae oblongae aut fusiformi-oblongae aut p. p. ovoideae, long. 0.009—0.014, crass. 0.0035—0.004 mm. Conidangia ovoidea aut late mammae-formi-ovoidea aut verrucaeformia, crass. 0.17—0.4 mm, basi non aut sat bene constricta. Conidia subcylindrica aut fusiformi-cylindrica, long. 0.009—0.005, crass. medio 0.001 mm.

Var. *neglecta* (Floerk.) Mass.

Sched. Crit. (1855) p. 82; Vain. l. c. II p. 226, III p. 252. *Capitularia neglecta* Floerk. Besch. Braunfr. Becherfl. (1810) p. 306 (in Web. Beitr. Naturk. II).

Exs. Schaer. Lich. Helv. Exs. III (1823) n. 54, 55, XI (1836) n. 270. — Fr. Lich. Suec. Exs. VIII n. 235 (in mus. Paris.). — Floerk. Clad. Exs. (1829) n. 23, 24. — Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 56, IX (1882) n. 401, 404, cont. (1921) n. 702, 703.

Thallus primarius squamis tenuioribus (medio circ. 0.24—0.032 mm crassis), adscendentibus, discretis. Podetia squamis destituta. Apothecia fusca.

Distr. In Lapponia pluribus locis, velut ad pag. Kemi, cet. (Vain. sec. annot.). LENont.: (J. P. Norrlin). LIM.: Vaonbed et ins. Vanasual (A. O. Kairamo). Ob.: Simo (V. Räsänen). Kuus.: In reg. subalp. montium Iivaara et Ukonvaara (Vain. Adj. Lich. Lapp. I p. 104). Meridiem versus ceterum frequenter.

Obs. *F. lophyra* (Ach.) Flot. Lich. Fl. Siles. (1849) p. 30; Vain. l. c. II p. 219, III p. 252 (*Cenomyce pyxidata* d. *C. lophyra* Ach. Lich. Univ., 1810, p. 535), podetiis squamosis. Locis numerosis visa. — *F. cerina* Arn. in Rehm Clad. Exs. (1889) n. 360, Vain. l. c. II p. 225, III p. 252, apotheciis carneis, nondum in Fennia lecta, sed ibi vix desit.

Var. *pocillum* (Ach.) Flot.

Linnaea 1843 p. 19; Vain. l. c. II p. 241, III p. 252. *Baeomyces pocillum* Ach. Meth. Lich. (1803) p. 336.

Thallus primarius squamis crassis (medio circ. 0.6—0.5 mm crassis), partim adpressis adnatisque, plus minus confluentibus, crustam formans. Podetia esorediata.

Distr. Ad terram humosam nudamque et muscos, saxa rupesque obtegentes, locis apricis, praecipue calcariis provenit. Satis typica paucis locis in territorio collecta est, saepissime in v. *neglectam* transiens.

Thallus primarius persistens, squamis circ. 13—2 mm longis latisque, materiam granuloso-farinosam albam abundanter continentibus. Hypothallus partim fruticulosus, partim byssoideus effususque.

38. **Cl. chlorophaea* (Floerk.) Spreng.

Cenomyce chlorophaea Floerk. in Sommerf. Suppl. Fl. Lapp. (1826) p. 130. *Cladonia chlorophaea* Spreng. Linn. Syst. Veg. IV (1827) p. 273; Schaer. Enum. Lich. Eur. (1850) p. 152; Zopf Flechtenst. (1907) p. 173, 291, 407, Beitr. Mon. Chem. Clad. (1908) p. 80. *Cl. pyxidata* **Cl. chlorophaea* Arn. Lich. Fränk. Jur. (Fl. 1884) p. 15; Nyl. Fl. 1884 p. 391. *Cl. pyxidata* s. *chlorophaea* Floerk. Clad. Comm. (1828) p. 70; Vain. l. c. II p. 232, III p. 252.

Exs. Floerk. Deutsch. Lich. III (1815) n. 57, Clad. Exs. (1829) n. 28, 36, 38—46. — Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 403, 405.

Icon. Arn. Lich. Exs. (1888) n. 1326, 1328, 1329. — Zopf Beitr. Mon. Chem. Clad. (1908) tab. III f. 2.

Thallus primarius squamis mediocribus minoribusve. Podetia e lamina thalli primarii enata, brevia aut saltem tabulatis brevibus, scyphifera, scyphis vulgo latis, regularibus, vulgo e parte inferiore mediave podetii sensim dilatatis, parte superiore plus minus sorediosa decorticataque, parte inferiore corticata, cortice verruculoso areolatove aut partim subcontinuo, typice esquamulosa, KHO haud distincte reagentia, acidum chlorophaeaticum et fumar-protocetraricum (sec. Zopf l. c.) continentia, parietibus sat crassis. Apothecia fusca aut raro pallida.

Distr. Supra muscos et terram in rupibus et saxis locis subhumidis umbrosisque aut siccis apertisque, saepe etiam ad terram nudam arenosam aut humosam muscosamve, saepe etiam ad tecta lignea vetusta aut rarius ad truncos putridos crescit. Nonnullis locis in Lapponia, velut ad Kōngäs prope Mare Glaciale in LIn. (Vain. Adj. Lich. Lapp. I p. 104), ad Venejoki in Kittilä (G. Lång) et alibi (E. Nylander) in LKem., ad Simo (V. Räsänen) et Ulaburgum (E. Nylander in Ob., ad Poussu in Kuus., ad Lentiira in Kuhmo

in OKaj. (Vain. l. c. p. 104), meridiem versus ceterum toto territorio sat frequenter proveniens.

Podetiis soresiosis a *Cl. pyxidata* differt, sed haec nota inconstans videtur, nam saepe podetia tantum parcissime soresiosa in eodem caespite cum podetiis haud soresiosis observantur. Ob notas chemicas **Cl. chlorophaea* tamen a *Cl. pyxidata* ut sub-species sit distinguenda.

Var. *pachyphyllina* (Wallr.) Vain.

Cl. pyxidata γ. *pocillum* *d. *pachyphyllina* Vain. Mon. Clad. Univ. II (1894) p. 245, III (1898) p. 252. *Patellaria fusca* h. *pyxidata* γ. *pachyphyllina* Wallr. Naturg. Säulch.-Flecht. (1829) p. 127 (Wallr. Crypt. Exs. I n. 402).

Thallus primarius squamis adpressis adnatisque. Podetiis soresiosis a *Cl. pyxidata* v. *pocillo* differens.

Distr. Ad muscos supra rupes in Lapponia Fennica (E. Nylander, a. 1856) et ad Kilo in Nylandia (A. A. Sola).

Obs. *F. costata* (*Cl. pyxidata* β. *costata* Floerk. Clad. Comm., 1828, p. 66, Cl. Exs., 1829, n. 37 p. p., 38, 39, Vain. l. c. II p. 238, III p. 252). Podetia semipellucida, squamis destituta, late decorticata, granulosa. Locis numerosis in prov. meridionalibus mediisque visa. — *F. pterygota* (*Cl. pyxidata* ε. *pterygota* Floerk. Clad. Comm., 1828, p. 69 Vain. l. c. II p. 220, III p. 252). Podetia squamosa. Locis numerosis in prov. meridionalibus collecta. — *F. centralis* (*Cl. pyxidata* **centralis* Flot. Lich. Fl. Siles., 1849, p. 30, Vain. l. c. II p. 223). Podetia proliferationibus subcentralibus. Parce obveniēns.

39. *Cl. fimbriata* (L.) Fr.

Lich. Eur. Ref. (1831) p. 222; Vain. l. c. II p. 246, 260, III p. 253. *Lichen fimbriatus* L. Spec. Plant. II (1753) p. 1152 n. 60.

Thallus squamis crassioribus. Podetia e superficie thalli primarii enata, elongata aut mediocria aut brevia, scyphifera aut ascypha, scyphis mediocribus aut angustis, vulgo e parte superiore podetiorum sat abrupte dilatatis, tota decorticata et subtiliter farinoso-soresiosa aut rarius parte inferiore corticata, esquamulosa aut raro squamulosa vel isidioideo-squamulosa, KHO non reagentia aut lutescentia, parietibus modice incrassatis, strato chondroideo indistincte (aut in var. exoticis distincte) limitatum. Apothecia fusca aut raro pallida.

Distr. Sat frequenter in reg. silvatica usque ad Kilpisjärvi in LENont. sec. Norrl. (Ber. Torn. Lappm. p. 318), in Ruoptuivaara et in jugo Suoloselkä in LIn. (Vain.), ad Kuolla et Kitofka (N. I. Fellman) in LTul., ad Svaetinos (Fellm.), Orlov et Rusinicha (Kihlm. Neue Beitr. Flecht. Kola p. 45), haud rara in Lapponia Kemensi (sec. annot. meas), obvia etiam in reg. subalpina montis Iivaara in Kuusamo (Vain.), meridiem versus adhuc frequentior.

Sec. Chodat (Mat. Fl. Crypt. Suisse IV, 1913, p. 205) gonidia *Cl. fimbriatae* ad *Cystococcum* (subg. *Eleuterococcum* Warén) irregularem Chod. pertinent et sec. Warén (Reink. Flectengon. p. 60) ad *C. glomeratum* Warén. — Zopf analysi chemica e *Cl. fimbriata* obtinuit acidum fumar-protocetraricum, fimbriaticum, atranoricum et nemoxynicum, materias diversas in variationibus diversis. Si hae differentiae constantes essent, quod adhuc incertum est, e *Cl. fimbriata* plures sub-species sejungendae essent: **Cl. cornutoradiata*, **Cl. nemoxyna*, **Cl. minor*, **Cl. coniocraea*, **Cl. ochrochlora* (et variationes exoticae), quae hic etiam describuntur.

Primum formae, in Vain. Mon. Clad. Univ. III p. 253 notis morphologicis distinctae, enumerantur.

- Podetia sat late scyphifera, sterilia scyphis terminata, tota decorticata sorediosaque aut basi subcorticata. Apothecia fuscescentia.

F. simplex (Weis) Flot. Podetia haud prolifera aut pedicellis apotheciiferis margini scyphorum affixis.

***F. major** (Hag.) Vain. Podetia 35—25 mm longa, parietibus saepe crassioribus.

***F. minor** (Hag.) Vain. Podetia circ. 25—10 mm longa, parietibus saepe tenuioribus.

F. prolifera (Retz.) Mass. Podetia prolifera.

- Podetia ascypha aut scyphis sat angustis abortivisve instructa.

F. cornutoradiata Coem. Podetia elongata, squamis destituta aut basin versus squamulosa, tota decorticata sorediosaque aut parte inferiore et interdum etiam infra apothecia subcorticata. Apothecia fusca. Conidia bene curvata.

***F. radiata** (Schreb.) Coem. Podetia elongata, scyphifera, scyphis proliferis, proliferationibus ascyphis cornutisque aut nonnullis abortive scyphiferis, fere tota sorediosa decorticataque.

**F. subulata* (L.) Vain. *Podetia elongata*, ascypha, fere tota decorticata solediosaque.

**F. furcellata* (Hoffm.) Vain. *Podetia ramosa*.

**F. capreolata* (Floerk.) Flot. *Podetia squamosa squamulosaque*.

**F. nemoxyna* (Ach.) Coem. *Podetia elongata*, scyphifera, prolifera, saepe etiam latere podetiorum ramosa, ramis proliferationibusque anguste scyphiferis aut nonnullis etiam ascyphis, saepe praesertimque parte inferiore sat late subcorticata.

**F. fibula* Ach. *Podetia elongata*, scyphis angustis, terminalibus aut margine in pedicellos breves apotheciorum excrescentibus, tota solediosa aut parte inferiore subcorticata.

[**F. Rei* Schaer. *Podetia prolifera* aut simplicia, parte inferiore super medium isidioideo-squamulifera, KHO—. In *Fennia nondum collecta*.]

**F. phyllocephala* Arn. *Podetia squamosa*, squamis usque inter apothecia productis.

Var. *apolepta* (Ach.) Vain. *Podetia* vulgo sat brevia, squamis destituta aut squamulosa squamosave, tota decorticata solediosaque aut passim praesertimque basin versus et infra apothecia corticata. Apothecia fusca aut pallida. Conidia vulgo leviter curvata.

**F. coniocraea* (Floerk.) Vain. *Podetia* sat brevia, tota decorticata solediosaque aut rarius parte inferiore et infra apothecia subcorticata. Apothecia fuscescencia.

**F. ceratodes* (Floerk.) Vain. *Podetia ascypha*, subulata, esquamulosa.

**F. truncata* (Floerk.) Vain. *Podetia anguste scyphifera*, esquamulosa.

**F. phyllostrota* Floerk. *Podetia squamosa*.

**F. ochrochlora* (Floerk.) Vain. *Podetia* vulgo sat brevia soledioso- et corticato-variegata, cavitate scyphorum corticata. Apothecia pallescentia aut fusciscenti-variegata.

F. pycnotheliza (Nyl.) Vain. *Podetia* brevissima apotheciisque terminata et esorediata aut in eodem specimine mediocria et solediosa atque latere apothecia subsessilia efferentia. Apothecia fusciscentia.

Cl. fimbriata (in sensu restr.).

Cl. fimbriata a. simplex a¹. major Vain. l. c. II p. 258, III p. 253.

Cl. fimbriata var. *simplex* Zopf Beitr. Chem. Mon. Clad. (1908) p. 73, tab. I f. 3 (excl. f. 2). Conf. p. 112.

Podetia long. circ. 35—25 mm aut breviora quoque, scyphifera, scyphis —12 mm latis, KHO non reagentia. Parietes podetiorum saepe firmiores crassioresque. Sec. Zopf (in Sandst. Clad. Nordw. Tiefl. II p. 372) acidum fumar-protocetraricum (circ. 1 %) et atranoricum (0.5 %) continent. Conidia fusiformi-cylindrica, vulgo curvata. — Exs. Rabenh. Clad. Eur. (1860) tab. X n. 5 dextr., tab. XII n. xx 1, 2, 3, 5 dextr., 6, tab. XIII n. xxii 10, Clad. Eur. Supl. (1863) tab. XV n. 15, 16 b; Coem. Clad. Belg. I (1863) n. 43, 45, 46 p. maj. p.; Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 406, 407, 408, 409 p. p. — Ad hanc speciem etiam ¹⁾*prolifera* Vain. (l. c. II p. 270, III p. 253), podetiis instructa KHO non reagentibus, proliferis, proliferationibus sterilibus scyphiferis, tabulatis infimis elongatis (long. circ. 10—40 mm), pertinet [conf. Zopf l. c. p. 100 (73), tab. III f. 1]. — Exs. Coem. Clad. Belg. I (1863) n. 51, Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 409 p. p. — Haec species sat frequenter in partibus meridionalibus mediisque territorii provenit, ad terram humosam arenosamque et ad muscos rupium crescens.

Obs. *F. anablastematica* Wallr. (Vain. l. c. II p. 274) est f. *prolifera* podetiis squamosis. Ad terram loco aperto in abiegno ad Pyhänsu in Pargas in Ab. (K. Linkola). Huic proximus est Arn. Lich. Exs. (1888) n. 1313.

***Cl. cornutoradiata.**

Cl. fimbriata f. *cornutoradiata* Coem. Clad. Ach. (1865) p. 40; Vain. l. c. II p. 275, 276, III p. 253; Zopf Beitr. Chem. Mon. Clad. (1908) p. 74, tab. I f. 4.

Podetia vulgo elongata, long. circ. 100—17, crass. 2—0.5 mm, ascypha aut scyphis sat angustis abortivisve, circ. 2—5 mm latis, sat regularibus aut irregularibus, apicibus sterilibus vulgo ascyphis cornutisque, squamis destituta aut basin versus squamulosa, KHO non reagentia, sec. Zopf (l. c.) acidum fumar-protocetraricum continentia. Conidia bene curvata.

F. radiata. *Lichen radiatus* Schreb. Spic. Fl. Lips. (1771) p. 122. *Cl. fimbriata* f. *cornutoradiata* subv. *radiata* Coem. Clad. Ach. (1865) p. 40; Vain. l. c. II p. 277, 279, III p. 253. — **Exs.** Floerk. Deutsch. Lich. III (1815) n. 56; Schaer. Lich. Helv. Exs. (1823) n. 61; Floerk. Clad. Exs. (1829) n. 32; Coem. Clad. Belg. I (1863) n. 54, 57 p. p., 58 p. p.; Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 412 p. min. p. — **Icon.** Arn. Lich. Exs. (1888) n. 1303. Podetia elongata, scyphifera, scyphis sat angustis, circ. 2—5 mm latis, proliferis, proliferationibus ascyphis cor-

nutisque aut nonnullis abortive scyphiferis, fere tota decorticata sorediosaque. Ad terram humosam arenosamque et ad muscos rupium sat frequenter in prov. meridionalibus territorii. Ad Kilpisjärvi in LEnont. (Norrl. Ber. Torn. Lappm. p. 318).

F. subulata. *Lichen subulatus* L. Spec. Plant. (1753) p. 1153. *Cl. fimbriata* γ^2 . *subulata* Vain. l. c. II p. 253, 287, III p. 282. — **Exs.** Rabenh. Clad. Eur. (1860) tab. XIII n. xx 14, tab. XIV n. xx 17, 18 p. p., 19 p. p., Clad. Eur. Supl. (1863) tab. XV n. 16 a; Coem. Clad. Belg. (1863) n. 59, 60, 61; Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 410 p. p., 412 p. p., cont. (1921) n. 705 p. p. Podetia elongata, long. circ. 17—100 mm, ascypha, simplicia aut subsimplicia, fere tota decorticata sorediosaque. Haud rara et septentrionem versus annotata usque ad Suoloselkä in LIn. (Vain.).

F. furcellata (Hoffm.) Vain. l. c. II p. 288, III p. 253. *Cl. furcellata* Hoffm. Deutschl. Fl. II (1796) p. 118. — **Exs.** Rabenh. Clad. Eur. (1860) tab. XIV n. xx 20; Coem. Clad. Belg. I (1863) n. 71, 73; Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 410 p. min. p., cont. (1921) n. 705 p. p. — **Icon.** Arn. Lich. Exs. (1888) n. 1307, 1308; Zopf Beitr. Chem. Mon. Clad. (1908) tab. I f. 4. Podetia elongata, ascypha, ramosa, fere tota decorticata sorediosaque. Cum f. *subulata* crescit, saepe in eam transiens.

F. capreolata (Floerk.) Vain. l. c. II p. 293, III p. 253. *Cl. pyxidata* ς . *chlorophaea* b. *capreolata* Floerk. Clad. Comm. (1828) p. 73. — **Exs.** Zwackh Lich. Exs. (1884) n. 882. — **Icon.** Arn. Lich. Exs. (1888) n. 1266. Podetia ascypha, squamosa squamulosaque, ramosa aut simplicia.

*Cl. nemoxyna.

Cl. nemoxyna Zopf Beitr. Chem. Mon. Clad. (1908) p. 110; Sandst. Clad. Nordw. Tiefl. (1912) p. 373. *Baeomyces radiatus* β . *B. nemoxynus* Ach. Meth. Lich. (1803) p. 302. *Cl. fimbriata* f. *cornutoradiata* subv. *nemoxyna* Coem. Clad. Ach. (1865) p. 40; Vain. l. c. II p. 295, 297, III p. 253. *Cl. fimbriata* **nemoxyna* Cromb. Lich. Dill. (1880) p. 559; Arn. Lich. Fränk. Jur. (1890) p. 16 (subsp.), Lich. Münch. (1891) p. 22. — **Exs.** Floerk. Deutsch. Lich. III (1815) n. 53, Clad. Exs. (1829) n. 34; Nyl. Herb. Lich. Paris. (1855) n. 21; Rabenh. Clad. Eur. Supl. (1863) tab. XVIII n. 3; Coem. Clad. Belg. (1863) n. 69 p. p. — **Icon.** Arn. Lich. Exs. (1888) n. 1302, 1335, (1890) n. 1495 (sup. et med.); Rehm Clad. Exs. (1890) n. 402 (sup. et med.); Zopf Beitr. Chem. Mon. Clad. (1908) tab. II f. 1.

Podetia elongata, long. circ. 25—90 mm, scyphifera, scyphis angustis, circ. 3.5—1.5 mm latis, margine scyphorum demum vulgo irregulariter radiata proliferave, saepe etiam latere podetiorum parcius

ramosa, ramis proliferationibusque anguste aut abortive scyphiferis, nonnullis etiam subulatis cornutisve, saepe praesertimque parte inferiore sat late subcorticata, tabulato infimo elongato, 3—0.5 mm crasso, squamis destituta aut saepe parte inferiore usque ad medium et interdum infra apothecia aut rarius fere tota sparse squamulosa squamosa-ve, squamulis vulgo tenuibus, parietibus saepe tenuioribus, KHO non reagentia, sec. Zopf (l. c. p. 76) acidum nemoxynicum continentia. Apothecia fusca aut livido-fuscescentia, saepe perforata. Conidia curvata.

Distr. Ad terram humosam et arenosam argillaceamque atque calcariam in sylvis locisque subumbrosis et campis apricis et supra rupes crescens, nonnullis locis lecta in Fennia, ad Helsingforsiam, ad Evo in Lammi et ad Piililä in Korpilahti in Ta. (Vain.).

Obs. *F. fibula* (Ach.), *Lichen fibula* Ach. Lich. Suec. Prodr. (1798) p. 194 (*Cl. fimbriata* f. *cornutoradiata* **nemoxyna* **fibula* Vain. l. c. II p. 300, 301, III p. 253), cujus podetia sunt elongata, circ. 20—45, raro —60 mm longa, 0.5—3 mm crassa, scyphis angustis (1—4, rarius —6 mm latis), sat regularibus, dentatis (aut conidangiis coronatis), terminalibus aut margine in pedicellos apotheciorum breves (circ. 0.5—6 mm longos), solitarios aut radiatos excrecentibus, simplicia, tota soresiosa aut parte inferiore sat late subcorticata, chemice non est explorata, quare incertum est, utrum ad **Cl. nemoxynam*, an ad **Cl. cornutoradiatam* pertineat. Locis numerosis in territorio nostro visa est. *Exs.*: Floerk. Clad. *Exs.* (1829) n. 35, Norrl. et Nyl. Herb. Lich. Fenn. II (1875) n. 59 p. p., 60 p. p., IX (1882) n. 411 a.

F. phyllocephala Arn. Lich. Münch. (1891) p. 23, *Cl. nemoxyna* f. *phyllocephala* Arn. Lich. *Exs.* (1890) n. 1495 inf. (icon) et in Rehm Clad. *Exs.* (1890) n. 402 inf. (icon), podetiis foliosis, anguste scyphiferis, foliolis usque inter apothecia productis, in Fennia forsitan obvenit, sed ibi nondum collecta.

**Cl. minor*.

Lichen pyxidatus a) *minor* Hag. Tent. Hist. Lich. (1782) p. 113. *Cl. fimbriata* a. *simplex* a². *minor* Vain. l. c. II p. 258, 262, III p. 253. — *Exs.* Rehm Clad. *Exs.* II (1875) n. 57. — *Icon.* Zopf Beitr. Chem. Mon. Clad. (1908) tab. I f. 2; Fink Bryologist 1904, tab. III f. 1.

Podetia long. circ. 25—10 mm, scyphifera, scyphis —7 mm latis, KHO levissime lutescentia aut demum subrufescentia aut haud distincte reagentia, sec. Zopf (l. c. p. 71, 100) acidum fumar-protocetraricum (1—1.5 0/0) et fimbriaticum (0.5 0/0, conf. Zopf Ann. d. Chem. 352 p. 26, Flechtenst. p. 50) continentia. — Ad truncos putridos pluribus locis lecta in Fennia.

Obs. 1. *F. minor* Hag. et *major* Hag. secund. icones a Zopf l. c. datas mixtae sint, ita ut *f. major* Zopf (l. c. p. 73, „*Cl. major* Zopf“ in Sandst. Clad. Nordw. Tiefl., 1912, p. 373, 381) *f. minorem* Hag. (tab. I f. 2) et *f. majorem* Hag. (tab. I f. 3) continet, et *f. minor* Zopf (tab. I f. 1) ad *f. minorem* Hag. pertineat. Lichen in tab. I f. 3 adumbratus autem sec. Sandst. (l. c. p. 372) continet acidum fumar-protocetraricum et (paululum) atranoricum, sed haud acidum fimbriaticum, quod posterius igitur in analysi a Zopf l. c. p. 73 descripta provenit ex alia forma immixta aut e lichene in tab. I f. 2 adumbrato, et sec. notas morphologicas haec planta est *f. minor* Hag. *Cladonia* a Zopf l. c. tab. I f. 1 heliotypice adumbrata major est, quam *f. minor* Hag. typica, sed notis chemicis sec. Zopf l. c. p. 71 cum ea congruens.

Obs. 2. Sec. Sandstede (Clad. Nordw. Tiefl. II p. 372) haec subsp. nominanda esset *Cl. fimbriata*, sed quia *f. major* Hag. frequentior est, quam *f. minor* Hag., melius etiam ut typus hujus speciei habeatur.

***Cl. coniocraea.**

Cenomyce coniocraea Floerk. Deutsch. Lich. VII (1821) p. 14 (excl. var.), n. 138. *Cl. fimbriata* (L.) Fr. *δ. apolepta* (Ach.) Vain. *δ¹. coniocraea* (Floerk.) Vain. l. c. II p. 308, III p. 254. *Cl. coniocraea* Sandst. Clad. Nordw. Tiefl. II (1912) p. 373. — Exs. Floerk. Deutsch. Lich. (1821) n. 138, Clad. Exs. (1829) n. 47 a, b; Rabenh. Clad. Eur. (1860) tab. XV n. xxi 1, 3; Coem. Clad. Belg. (1863) n. 65, 81, 82; Mudd Mon. Brit. Clad. (1865) n. 12, 23; Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 413 a, b, 415, 416, cont. (1921) n. 706; Havaas Lich. Exs. Norv. (1902) n. 84; Malme Lich. Suec. Exs. XXV (1916) n. 603 a, b. — **Icon.** Ach. Meth. Lich. (1803) tab. VII f. 7; Arn. Lich. Exs. (1888) n. 1301, 1331, 1333; Fink Bryologist 1904, tab. III f. 6.

Podetia vulgo sat brevია, long. 3—20, rarius —40 mm, ascypha aut scyphis angustis abortivisve, 1—2 mm latis terminata aut infra pedicellum brevem apothecii instructa, tota decorticata sorediosaque aut rarius basin versus et infra apothecia corticata, impellucida, glauco-virescentia aut rarius albida aut cinereo-fuscescentia, KHO non reagentia, sec. Zopf (conf. p. 113) acidum fumar-protocetraricum continentia. Apothecia fusca aut fusco-rufescentia. Conidia vulgo leviter curvata.

Distr. Ad truncos putridos et supra muscos rupium saxorumque locis subapricis apricisque et subumbrosis et rarius ad terram arenosam muscosamve locis apricis siccisque crescit. Sat frequenter in prov. meridionalibus mediisque, pluribus locis in Karelia bor. et Ostrobotnia Kajanensi, annotata etiam ad Paanajärvi in Kuusamo (Vain. Adj. Lich. Lapp. I p. 106), ad Simo in Ostrobotnia bor. (V. Räsänen).

Obs. 1. *F. ceratodes* (Floerk.) Vain. l. c. II p. 314, III p. 254 (*Cl. ochrochlora* f. *ceratodes* Floerk. Clad. Comm., 1828, p. 77), podetiis ascyphis, subulatis, esquamulosis instructa, haud rara. — *F. truncata* (Floerk.) Vain. l. c. II p. 314, III p. 254 (*Cl. ochrochlora* b. *truncata* Floerk. Clad. Comm., 1828, p. 77), podetiis anguste scyphiferis, esquamulosis, sat frequenter in prov. meridionalibus mediisque. — *F. phyllostrota* (Floerk.) Vain. l. c. II p. 315, III p. 254 (*Cl. ochrochlora* β . *phyllostrota* Floerk. Clad. Comm., 1828, p. 79), podetiis squamosis, ascyphis aut anguste scyphiferis, nonnullis locis, praesertim ad domicilia, collecta.

Obs. 2. Quamquam podetia hujus lichenis KHO non reagentia, Zopf (Beitr. Chem. Mon. Clad., 1908, p. 75) indicat **Cl. coniocraeam* continere etiam acidum atranoricum ($1\frac{1}{3}$ 0/0), quod in KHO reactionem luteam ostendit, sed planta ab eo l. c. in tab. II f. 2 heliotype adumbrata habitu omnino similis est **Cl. ochrochloae*, cujus podetia KHO plus minus distincte lutescentia. Zwackh Lich. Exs. (1888) n. 1009, ut vera **Cl. ochrochlora* a Zopf (sec. Sandst. Clad. Nordw. Tiefl. II, 1912, p. 374) chemice scrutatus, acidum fumar-protocetraricum (sed non atranoricum) continens, a me denuo morphologice examinatus, in specimine meo revera facie externa subsimilis est **Cl. ochrochloae*, sed podetiis KHO haud distincte lutescentibus, in specimine in herb. Nyl. asservato autem magis est similis **Cl. coniocraeae*, nec KHO lutescens, quare ad **Cl. coniocraeam* pertinet, et notae chemicae a Zopf **Cl. ochrochloae* indicatae adtribuendae sunt **Cl. coniocraeae* et vice versa.

Obs. 3. *F. pycnotheliza* (Nyl.) Vain. (*Cl. pycnotheliza* Nyl. Fl., 1875, p. 441, *Cl. fimbriata* ϵ . *pycnotheliza* Vain. l. c. II p. 470, 330, III p. 254). Podetia brevissima apotheciisque terminata et esorediata aut in eodem specimine etiam 5–15 mm longa, plus minus soresiosa aut nonnulla tota corticata, glaucescentia aut albido-glaucescentia, KHO non reagentia, raro anguste scyphifera, latere apothecia subsessilia aut breviter stipitata efferente, squamis destituta aut bene squamosa. Apothecia lat. 0.8–1.5 mm, fusconigra fuscave. Ad truncos putridos et supra muscos ad saxa et rupes in silvis et rarius in pratis in Nylandia, Karelia austr., Tavastia austr., Tavastia bor., Savonia bor. Partim est deflexus regressivus, statu morbo productus.

***Cl. ochrochlora.**

Cl. ochrochlora Floerk. Clad. Comm. (1828) p. 75 p. p. (Arn. Lich. Fragm. 31, 1892, p. 3). *Cl. fimbriata* δ . *apolepta* δ^2 . *ochrochlora* Vain. l. c. II p. 319, 325, III p. 254. — Exs. Floerk. Clad. Exs. (1829) n. 48 c, d; Rabenh. Clad. Eur. (1860) tab. XV n. xxi 5; Coem. Clad. Belg. I (1863) n. 86, II (1866) n. 110; Hepp Flecht. Eur. III (1860) n. 540; Anzi Clad. Cisalp. (1863) n. 8 B; Mudd Mon. Brit. Clad. (1865) n. 26; Zwackh

Lich. Exs. (1880) n. 563 a, b, c; Rehm Clad. Exs. (1887) n. 336, (1890) n. 403; Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 707.

Podetia vulgo sat brevia, long. circ. 5—40 (raro —55) mm, ascypha aut scyphis angustis, abortivis aut raro bene evolutis (—3, raro —6 mm latis) instructa, soredioso- et corticato-variegata, passim praesertimque parte inferiore et infra apothecia corticata aut tota sorediosa, squamosa aut squamis destituta, impellucida, vulgo albida vel glaucescenti- vel cinerascenti-albida, KHO plus minus distincte lutescentia (praesertim apices versus), partibus decorticatis non reagentibus, acidum fumar-protocetraricum et verisimiliter atranoricum (paululum) continentia (conf. sub **Cl. coniocraea*, p. 113). Apothecia vulgo typiceque pallida testaceave. Conidia leviter curvata.

Distr. Ad truncos putridos et lignum vetustum in silvis et supra muscos rupium saxorumque locis umbrosis subumbrosisque crescens, pluribus locis in territorio nostro collecta.

Notae chemicae hujus lichenis nondum satis cognitae. Planta in Zopfii Beitr. Chem. Mon. Clad. tab. II f. 2 heliotypice adumbrata, ad **Cl. ochrochloram* pertinens, sec. hunc illustrum auctorem acidum fumar-protocetraricum $1\frac{3}{4}\%$ continet et acidum atranoricum tantum $1\frac{3}{4}\%$, quare reactio materia posteriore producta ad hunc lichenem determinandum est vacillans, nec satis distincta. Nec melius notis morphologicis **Cl. ochrochlora* et **Cl. coniocraea* distingui possunt, quare in Vain. l. c. III p. 254 ut modificationes ad *Cl. fimbriatam* v. *apoleptam* (Ach.) Vain. relatae sunt. Variationes et formae *Cl. fimbriatae* methodo lichenologico ad ulterius melius determinantur, quam analysi chemica.

40. *Cl. pityrea* (Floerk.) Fr.

Nov. Sched. Crit. (1826) p. 21; Floerk. Clad. Comm. (1828) p. 79; Vain. l. c. II p. 349, III p. 255, Lich. Ins. Philipp. III (1921) p. 53; Lynge Stud. Lich. Norw. (1921) p. 80. *Capitularia pityrea* Floerk. in Berl. Magaz. 2 (1808) p. 135.

Exs. Floerk. Deutsch. Lich. X (1821) n. 193 A, B. — Fr. Lich. Suec. Exs. VIII (1826) n. 236. — Floerk. Clad. Exs. (1829) n. 49—55. — Nyl. Herb. Lich. Par. I (1855) n. 20. — Rabenh. Clad. Eur. (1860) tab. XVI n. xxiii 1, Clad. Eur. Supl. (1863) tab. XVI n. 2. — Coem. Clad. Belg. I (1863) n. 87—100, II (1866) n. 101—103. — Mudd Mon. Brit. Clad. (1865) n. 28, 29. — Rehm Clad. Exs. (1886) n. 314, (1889) n. 368. — Zwackh Lich. Exs. (1879) n. 515 A, B, (1883) n. 825, 860 A, B, (1884) n. 885 A, B, (1886) n. 951 A, B, 952—955 A, B, 956, 957. — Zahlbr. Krypt. Exs. Vindob. XVI (1907) n. 1535, XXII (1914) n. 2161. — Malmé Lich. Suec. Exs. XX (1915) n. 477.

Icon. Arn. Lich. Exs. (1889) n. 1417. — Fink Bryologist (1907) t. VII f. 2.

Thallus primarius demum evanescens, squamis tenuioribus et vulgo minoribus. Podetia e lamina thalli primarii enata, vulgo brevia aut raro sat elongata, ascypha aut scyphifera, scyphis angustis, vulgo irregularibus, corticata aut fere tota decorticata, vulgo partim increbre granulosa aut rarius esorediata, esquamulosa aut squamulosa, impellucida aut subimpellucida, KHO non reagentia aut lutescentia, parietibus tenuibus, strato chondroideo distincte limitato. Apothecia testacea aut fusco-rufescentia aut raro pallida.

Distr. Specimina certe huc pertinentia nondum in Fennia collecta sunt. Inter muscos ad saxum in alneto ad Nisula prope Jyväskylä in Tavastia bor. a K. Linkola specimen subsimile *Cl. pityreae* collectum est, sed quum morbosum est, vix sit certe determinabile, et forsitan ad deflexum *Cl. fimbriatae* pertinet.

Cl. pityrea var. *Zwackhii* f. *esorediata* Vain. sec. Zopf [Beitr. Chem. Mon. Clad. (1908) p. 85 et 101] acidum fumar-protocetraricum (1.5 %) continet. F. *sorediosa* Vain. (l. c. III p. 255), ejus podetia sorediosa et KHO leviter lutescentia, forsitan etiam acidum atranoricum continet et in hoc casu ut subspecies a *Cl. pityrea* disjungenda esset, sicut etiam plures variationes exoticae.

c. **Foliosae** (Bagl. et Carest.) Vain.

Thallus primarius squamis majoribus maximisve, elongatis, saepe partim subtus sulfureis aut subsulfureis. Podetia scyphifera aut ascypha, straminea aut glaucescentia obscuratave. Apothecia saepe marginata, pallescentia aut fusca.

41. **Cl. foliacea** (Huds.) Schaer.

Lich. Helv. Spic. VI (1833) p. 294; Willd. Fl. Berol. (1787) p. 363 (emend.). *Lichen foliaceus* Huds. Fl. Angl. ed. 1 (1762) p. 457 n. 62 (emend.).

Thallus primarius squamis maximis aut rarius majusculis, laciniis vulgo linearibus, KHO cum CaCl_2O_2 lutescentibus. Podetia brevia, partim scyphifera, partim ascypha, esorediata, KHO cum CaCl_2O_2 lutescentia. Apothecia vulgo subtestacea.

Var. *alcicornis* (Lightf.) Schaer.

Lich. Helv. Spic. VI (1883) p. 294; Vain. l. c. II p. 385, III p. 260. *Lichen alcicornis* Lightf. Fl. Scot. II (1777) p. 872 p. p.; Ach. Lich. Suec. Prodr. (1798) p. 184. *Cl. foliacea* Willd. Fl. Berol. (1787) p. 363.

Exs. Floerk. Deutsch. Lich. (1815) n. 58. — Fr. Lich. Suec. Exs. (1826) n. 210. — Floerk. Clad. Exs. (1829) n. 6. — Havaas Lich. Exs. Norv. (1905) n. 269. — Malme Lich. Suec. Exs. XXX (1918) n. 731.

Thallus primarius squamis angustioribus, vulgo circ. 1 (rarius 0.5—3) mm latis, subtus sulfureis albidisve, KHO non reagentibus, rhizinis marginalibus obscuris saepe instructus, KHO non reagens.

Distr. Ad terram in pinetis et ericetis et campis sterilibus arenosis calcariisve (sec. Flot. cet.) crescit, in locis vulcanicis et ubi silex abundat frequentius occurrit sec. Jatta (Mon. Lich. It. Merid. p. 87). Sec. E. Nylander locis ventosissimis in Alandia passim, velut in Jurmo, Kökar, Signilskär, tantum ster. (Ål. Lafveg., 1857, p. 81).

Thallus primarius persistens, squamis circ. 5—30 mm longis, circ. 0.30—0.45 mm crassis, superne stramineo-glauciscentibus vel flavidis aut pallido-flavescentibus, strato corticali 0.040—0.100 mm crasso, in strato medullari hyphis materia granulosa straminea incrustatis (sec. Zopf granulis calcii oxalatici), sec. Zopf (Beitr. Chem. Mon. Clad. p. 90, 102) acidum laevo-usninicum (0.5 $\frac{0}{0}$) et fumar-protocetraricum ($\frac{1}{3}$ $\frac{0}{0}$) continentia. Podetia e lamina thalli enata, long. —13, prolifera —17 mm, basi crass. 0.5—2 mm, scyphis 2—5 mm latis, saepe e centro aut e margine proliferis, aut ascypha, flavescentia aut glauciscentia aut raro sulfurea, cortice continuo aut areolato, partibus decorticatis sulfureis aut albidis, squamis destituta aut praesertim margine scyphorum squamosa, parietibus 0.2—0.5 mm crassis, strato chondroideo indistincte limitato. Apothecia lat. 0.8—2.3 mm, subtestacea aut rarius fusca, convexa, suffulta. Sporae oblongae aut rarius fusiformi-oblongae, long. 0.008—0.014, crass. 0.002—0.0035 mm. Conidangia late ovoidea vel mammaeformia aut subglobosa, lat. 0.290—0.400 mm, basi bene aut leviter constricta, fusciscentia aut rufescentia aut testaceo-pallida. Conidia cylindrico-fusiformia aut p. p. subcylindrica, leviter curvata, long. 0.007—0.010, crass. 0.0005—0.001 mm.

Obs. Var. *convoluta* (Lam.) Vain. l. c. II p. 394, III p. 260. *Lichen convolutus* Lam. Encycl. Bot. III (1789) p. 500 (excl. β). *Lichen (endivifolius)* Dicks. Fasc. Tert. Crypt. Brit. (1793) p. 17. *Cl. endiviaefolia* Fr. Lich. Eur. Ref. (1831) p. 212. Exs. Schaer. Lich. Helv. Exs. (1843) n. 456, Nyl. Herb. Lich. Par. II (1855) n. 106, Rabenh. Lich. Eur. Exs. X (1857) n. 281, Clad. Eur. (1860) tab. I n. 1, Coem. Clad. Belg. I (1863) n. 7, Hepp Flecht. Eur. IV (1867) n. 800, Rehm Clad. Exs. II (1875) n. 51, 52, V (1885) n. 279, (1893) n. 434, Malme Lich. Suec. Exs. XXX (1918) n. 729 et 730 (in v. *alcic. accedentes*). Squamae thalli latae (circ. 2—3 aut partim 1—10 mm latae), vulgo etiam ad ambitum latae, saepe crassiores (crass. circ. 0.330—0.600 mm), subtus sulfureae aut albido-stramineae, KHO non reagentes, circ. 7—40 (—60) mm longae, apice diu accrescentes et basi simul emorientes, rhizinis nullis aut parvis, albidis. Ad terram calcariam et silaceam crescens et in regionibus Mediterraneis frequenter proveniens, in Fennia nondum collecta est. — Var. *firma* (Nyl.) Vain. l. c. II p. 400, III p. 261; Hue Lich. Extra-Eur. (1901) p. 67. *Cl. alcicornis* var. *firma* Nyl. Syn. Lich. p. 191. *Cl. firma* Arn. Lich. Exs. (1898) n. 1754 (excl. specim. v. *alcicornis*); Harm. Lich. Fr. III (1907) p. 323 (Nyl. Bot. Zeit. 1861 p. 352, excl. *Cl. subcariosa*). Squamae thalli majusculae, long. circ. 5—15 mm, sat latae, superne glaucescentes, subtus albae aut subcinereo-rufescentes, superne KHO dilute lutescentes, et addito CaCl_2O_2 distinctius lutescentes. Sine dubio analysi chemica exactiore a *Cl. foliacea* distingui potest et autonoma sit species, sed adhuc defecte cognita. In Fennia non est collecta.

42. *Cl. strepsilis* (Ach.) Vain.

l. c. II p. 403, III p. 261; Malme Sv. Bot. Tidskr. 1916 p. 83; Lynge Stud. Lich. Norw. (1921) p. 75. *Baeomyces strepsilis* Ach. Meth. Lich. Suppl. (1803) p. 52. *Cenomyce coralloidea* Ach. Lich. Univ. (1810) p. 528. *Cl. athelia* Nyl. Fl., 1858, p. 378. *Cl. alcicornis* f. *cryptochlora* Th. Fr. Lich. Scand. (1871) p. 95. *Cl. sobolifera* Nyl. in Norrl. Herb. Lich. Fenn. IX (1882) n. 428. *Cl. polybotrya* Nyl. Fl. 1887 p. 130.

Exs. Mudd Mon. Brit. Clad. (1865) n. 4. — Rehm Clad. Exs. III (1879) n. 104, (1883) n. 196, (1887) n. 337, (1892) n. 420, 421. — Zwackh Lich. Exs. (1887) n. 1000 A, B. — Arn. Lich. Exs. (1878) n. 784, (1887) n. 1252, 1252 b, (1892) n. 1544. — Norrl. et Nyl. l. c. n. 428. — Zahlbr. Krypt. Exs. Vindob. XX (1912) n. 1963.

Thallus primarius squamis partim majusculis, partim minoribus, sinuoso-sublinearibus, KHO cum CaCl_2O_2 aeruginosis. Podetia ad apicem thalli primarii enata, brevia, irregularia, ascypha, typice esorediata, corticata, KHO cum CaCl_2O_2 aeruginosa, basi haud maculata. Apothecia fusca aut raro pallescentia.

Distr. Ad terram humosam in turfosis, ad terram arenosam cum Polytricho pilifero et supra Brya locis apicis siccis et ad terram macram supra rupes humiles collecta est. Nylandia: Jungfruberget in Kyrkslätt (A. Kullhem), Tölö Helsingforsiae (J. P. Norrlin).

Thallus primarius persistens aut demum evanescens et squamis novis hypothallo affixis renovatus, long. 2—20 mm, crass. 0.20—0.45 mm, sat fragilis, superne glaucescens aut olivaceo- vel pallido-glaucescens, subtus intusque albus aut albido-subsulfureus, typice esorediatus (sec. Sandst. raro sorediosus) KHO leviter lutescens aut haud reagens, addito CaCl_2O_2 bene reagens, interdum apice sat diu accrescens et simul basi emoriens, laciniis partim sinuoso-linearibus, circ. 0.8 (0.5—3.5) mm latis, strato corticali 0.040—0.110 mm crasso. Podetia in apice aut ad apicem in lamina thalli primarii enata, long. 3—21 et crass. 1—3 mm minorave, irregulariter subcylindrica aut apicem versus dilatata, apotheciis perfectis aut imperfectis semper terminata, irregulariter varieve ramulosa, apicibus axillisque fissis aut typice clausis, cortice areolato verrucosove aut partim subcontinuo, areolis dispersis contiguisve, esorediosa (aut in f. *sorediata* Sandst., Clad. Nordwestdeutsch. Tiefl. II p. 377, isidioideo-sorediosa), squamosa aut rarius squamis destituta, glaucescentia aut olivaceo- vel pallido- vel albido-glaucescentia, KHO leviter lutescentia aut non reagentia, parietibus 0.180—0.400 mm crassis. Sec. Zopf (Liebig's Ann. d. Chem. 327, 1903, p. 332, 335, Flechtenst., 1907, p. 325, Beitr. Chem. Mon. Clad., 1908, p. 97, 102) haec species continet acidum thamnolicum et strepsilinum. Stratum chondroideum haud bene evolutum, hyphis pachydermaticis, disjunctis et passim parcius etiam conglutinatis, ad cavitatem podetiorum plus minus laceratum. Apothecia parva, lat. 0.3—1.2 (—2) mm, solitaria aut aggregata et saepe etiam subcorymbose conferta, infra marginem constricta peltataque aut rarius usque ad marginem suffulta, primo vulgo plana margineque distincto aut raro jam mox convexa immarginataque. Sporae ovoideo-oblongae oblongaeve, long. 0.007—0.011, crass. 0.003—0.0035 mm. Conidangia ad marginem thalli primarii affixa, sessilia aut brevissime stipitata, ovoidea aut dolioliformia aut mamillaria, lat. 0.320—0.400 mm, basi haud aut leviter constricta, nigricantia aut fusciscentia aut basin versus pallidiora. Conidia fusiformi-cylindrica aut p. p. subcylindrica, sat leviter curvata, long. 0.008—0.010, crass. 0.0005 mm.

Obs. F. *glabrata* Vain. l. c. II p. 409, III p. 261, podetiis squamulosis, et f. *coralloidea* Vain. II p. 409, III p. 261 (Hulting Bot. Not. 1915 p. 61), podetiis squamosis, mixtae in speciminibus Fennicis proveniunt.

d. **Ochroleucae** Fr.

Thallus primarius squamis minoribus. Podetia fertilia aut etiam sterilia, scyphifera aut ascypha, flavescentia stramineave. Apothecia pallescentia.

43. **Cl. botrytes** (Hag.) Willd.

Fl. Berol. (1787) p. 365; Hoffm. Deutschl. Fl. II (1796) p. 128; Vain. l. c. II p. 412, III p. 261. *Lichen (botrytes)* Hag. Tent. Hist. Lich. (1782) p. 121.

Exs. Fr. Lich. Suec. Exs. III (1824) n. 80. — Stenh. Lich. Suec. Exs. n. 202 (sec. Th. Fr. Lich. Scand. p. 72). — Th. Fr. Lich. Scand. Exs. (1859) n. 14. — Fellm. Lich. Arct. (1864) n. 36. — Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 420. — Havaas Lich. Norv. Exs. (1904) n. 243. — Zahlbr. Krypt. Exs. Vindob. XXII (1914) n. 2162 a, b. — Malme Lich. Suec. Exs. XXI (1915) n. 513.

Podetia brevia, ascypha aut raro subscyphifera, scyphis obsoletis, irregularibus, in radios divisus, apotheciis semper terminata, cortice areolato, esorediata, straminea aut stramineo-glauescentia.

Distr. Ad truncos putridos praesertim coniferarum in pinetis aliisque silvis siccis, sicut etiam in campis aliisque locis apertis, ad parietes tectaque lignea vetusta, raro ad terram humosam locis siccis crescit, sat frequenter in territorio nostro usque ad Ostrobotniam Kajanensem distributa. Kuus.: In reg. subalpina montis Iivaara (Vain. Adj. Lich. Lapp. I p. 103). Ob.: Adhuc ad Simo et Kemi (V. Räsänen), Alkkula (E. Nylander), „nec rara in reg. coniferarum“ (sec. Norrl. Ber. Torn. Lappm. p. 320), etiam ad Louppio, Isovaara et Vuornovaara prope Tornio et Haaparanta in Suecia (Hellb. Norrl. Lafv. p. 70). LKer.: Vuostimovaara in Kemi-järvi (Vain. l. c.), „haud rara in reg. coniferarum“ (Norrl. l. c.). KKer.: Soukelo, Koutajärvi (Fellm. in Nyl. Lich. Lapp. Or. p. 109), Knjäsä et Knjäsä-guba (Fellm.). LIm.: Imandra (Fellm.), Porja-guba (G. Selin), Pontschozero et Ump-nishk (A. O. Kairamo). LENont.: „In reg. betulina pluribus locis usque ad Kilpisjärvi“ (Norrl. l. c.). Finmarkia: Puolmak (Th. Fr. Lich. Scand. p. 72).

Thallus primarius squamis 1.5—0.3 mm longis, 0.200—0.240 mm crassis superne stramineis aut glaucis aut rarius olivaceo-glauciscentibus, esorediosis aut subtus parcissime sorediosis granulosisve, KHO non reagentibus, addito CaCl_2O_2 superne et subtus lutescentibus. Podetia e lamina thalli primarii enata, long. 3—20 (1—30) mm, crass. 0.3—1.5 (—2) mm, squamis destituta aut basin versus squamosa squamulosave, KHO non reagentia aut dilute lutescentia, parietibus 0.050—0.300 mm crassis, strato chondroideo distincte limitato. Apothecia pallida aut carneo-pallida aut testaceo- vel livido-pallescentia aut livido-fuscescentia, raro tenuissime pruinosa, lat. 0.5—1.5 (0.3—6) mm. Sporae long. 0.007—0.014, crass. 0.002—0.0035 mm, oblongae aut ovoideo- aut fusiformi-oblongae. Conidangia brevissime subcylindrica, crass. 0.060—0.110 mm, long. 0.040—0.050 mm, basi non constricta, nigra, materiam coccineam non continentia. Conidia cylindrica, leviter aut bene curvata, long. 0.008—0.005, crass. 0.0005 mm.

44. Cl. carneola Fr.

Lich. Suec. Exs. IV (1824) n. 115, Sched. Crit. (1824) p. 23; Vain. l. c. II p. 420, III p. 261.

Exs. Fr. l. c. — Stenh. Lich. Suec. Exs. n. 199 (sec. Th. Fr. Lich. Scand. p. 72). — Hepp Flecht. Eur. I (1853) n. 1, IV (1867) n. 791. — Rabenh. Clad. Eur. (1860) tab. IX n. XII 1—4, Lich. Eur. Exs. XXX (1868) n. 818. — Rehm Clad. Exs. (1883) n. 160 (n. 145 est *Cl. pleurota). — Arn. Lich. Exs. (1883) n. 1073.

Podetia brevia aut sat brevia (aut proliferationibus demum elongata), scyphifera, scyphis vulgo regularibus, saepe sterilia, parte superiore decorticata sorediosaque, substraminea aut sulfurea.

Distr. Ad terram humosam et truncos putridos in pinetis aliisque silvis siccis, et supra muscos et terram ad saxa et rupes praesertim in silvis, nec non ad terram turfosam et in campis apricis provenit, sat rara toto territorio. Finmarkia: Ad Puolmak (Th. Fr. Lich. Scand. p. 73). LTul.: Kuolla (N. I. Fellman). LENont.: „In reg. pinifera inter Hetta et Vuontisjärvi et in reg. betulina ad Kilpisjärvi“ (Norrl. Ber. Torn. Lappm. p. 320). LKem.: „In reg. abietina inter Muonio et Ylikylä et ad Pahtarinne“ (Norrl. l. c.), Alkkula (E. Nylander), ad Louppio et Isovaara in valle fluminis Tornio et in Vuornovaara ad Haaparanta in Suecia (Hellb. Norrl. Lafv.

p. 69). K Ker.: Knjäsä (Fellm.). Kuus.: In reg. abietina montis Näränkävåara (Vain. Adj. Lich. Lapp. I p. 103). Pluribus locis in prov. magis meridionalibus.

Thallus primarius squamis 3—13 mm longis, 0.3—0.2 mm crassis, superne stramineo-glauciscentibus aut rarius glaucis aut pallido-stramineis, subtus intusque albis aut rarius substramineo-albidis, esorediosis aut subtus saepe parce granulosis, KHO non reagens, addito CaCl_2O_2 subtus distincte lutescentibus et saepe etiam superne dilutissime lutescentibus. Podetia e lamina aut e margine thalli primarii enata, long. circ. 6—40 mm, crass. 0.7—4 mm, turbinata aut tubaeformia, scyphis 2—15 mm latis, diaphragmate clausis, simplicia aut tabulatis 1—3, tabulatis inferioribus 6—25 mm altis, apicibus scyphiferis aut radiis apothecio terminatis, basin versus aut maxima infima parte corticata, sorediis vulgo farinosis, rarius granulosis, squamis destituta aut raro basin versus parce squamulosa, KHO dilutissime lutescentia, addito CaCl_2O_2 bene lutescentia, partibus emorientibus cyaniscentibus aut fusciscentibus pallescentibusve, parietibus 0.2—0.32 mm crassis, strato chondroideo haud distincte limitato. Apothecia lat. 6—1.5 mm, suffulta aut rarius subpeltata, pallida aut carneo-vel livido-pallescentia aut rarius livido-testacea, epruinosa. Sporae oblongae aut ovoideae, long. 0.007—0.012, crass. 0.0025—0.0035 mm. Conidangia in margine scyphorum sita, brevissime podicellata aut sessilia, dolioliformia aut breviter subcylindrica aut conoideo-verrucaeformia, crass. 0.150—0.190 mm, basi haud aut levissime constricta aut parte infima margini scyphi dentisve immersa, nigra, basin versus pallidiora, materiam coccineam non continentia. Conidia subfusiformia, curvata aut leviter curvata, long. 0.008—0.005, medio crass. 0.001 mm.

Obs. *F. phyllocephala* Oliv., Etud. Clad. (1881) p. 231, Vain. l. c. II p. 427, III p. 261, podetiis squamosis instructa, nondum omnino typica in Fennia collecta.

45. **Cl. bacilliformis* (Nyl.) Vain.

l. c. II p. 428, III p. 261. *Cl. carneola* var. *bacilliformis* Nyl. in Herb. Mus. Fenn. (1859) p. 79, Syn. Lich. (1858—60) p. 201, Lich. Scand. (1861) p. 54.

Exs. Rehm (Arn.) Clad. Exs. III (1879) n. 146. — Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 419, cont. (1921) n. 712 (f. *scyphi-fera*).

Podetia brevia, ascypha (aut raro anguste scyphifera), vulgo simplicia, vulgo sterilia, soresiosa, decorticata, sulfurea aut straminea.

Distr. Ad truncos putridos in pinetis aliisque silvis et locis apricis, in saepimentis vetustis, supra muscos ad saxa et rupes crescit, in territorio nostro usque ad Ostrobothniam Kajanensem sat frequenter aut passim proveniens, et septentrionem versus rarior. Kuus.: In reg. abietina montis Näränkäväära et in reg. coniferarum mixtarum ad Paanajärvi (Vain. Adj. Lich. Lapp. I p. 103) et Kitkajoki (F. Silén). Ob.: Simo (V. Räsänen). KKER.: Ruanjärvi et Knjäsä-guba (N. I. Fellman). LKem.: In reg. coniferarum prope Pyhätunturi (Vain.), ad Templum in Kittilä (G. Lång), Ounastunturi (Norrl. Ber. Torn. Lappm. p. 320). LEnont.: In reg. silvatica pluribus locis usque ad Hetta et Kilpisjärvi (Norrl. l. c.). LIn.: In reg. pinifera prope lac. Inarijärvi (Vain. l. c.) et ad Tsitsanjarga ad Paatsjoki (A. W. Granit et B. R. Poppius).

Thallus primarius squamis subtus vulgo crebre farinoso-soresiosis. *Podetia* long. 3—15 (—25), crass. 0.2—2 mm, apicibus sterilibus subulatis aut obtusis, squamis destituta, KHO dilute lutescentia aut partibus esoresiosis etiam non reagentibus, addito CaCl_2O_2 distincte lutescentia, apicibus haud diu accrescentibus, partibus emorientibus saepe livido-fuscescentibus aut caeruleo-nigricantibus, parietibus circ. 0.160—0.050 mm crassis, strato chondroideo circ. 0.160—0.025 mm crasso, distincte limitato. Apothecia lat. 1—0.5 mm, subpeltata, vulgo mox immarginata, convexa aut depresso-convexiuscula, pallida aut carneo-vel livido-pallescentia aut livido-testacea, epruinosa. Sporae oblongae aut fusiformi-oblongae, long. 0.009—0.012, crass. 0.0025—0.004 mm. Conidangia ovoidea aut dolioliformia aut subcylindrica, crass. 0.110—0.180 mm, basi leviter aut non constricta, fusconigra aut fuscescentia, basin versus pallidiora. Conidia cylindrico-fusiformia aut parcius fere cylindrica, leviter curvata, long. 0.006—0.005, crass. 0.0005 mm.

Obs. *F. scyphifera* Norrl. (in Norrl. et Nyl. Herb. Lich. Fenn. cont., 1921, n. 712), podetiis scyphiferis, scyphis abortivis aut distincte evolutis, irregularibus, circ. 1—2 mm latis, diaphragmate integro clausis, margine dentatis aut integris aut breviter radiatis, radiis subulatis cornutisve (videas Vain. l. c. II p. 429). In eodem caespite aut una cum

podetiis ascyphis observatur. Ad truncum putridum pini prope Uusikartano in Hollola (J. P. Norrlin) et ad Hakala in Luhanka (Vain.) in Ta. Podetia solitaria etiam alibi visa.

43. **Cl. cyanipes* (Sommerf.) Vain.

l. c. II p. 431, III p. 261. *Genomyce cyanipes* Sommerf. Phys. Beskr. Saltd. (1826) n. 62. *Genomyce carneopallida* β . *cyanipes* Sommerf. Suppl. Fl. Lappm. (1826) p. 129 p. p. *Cl. carneola* **Cl. cyanipes* Th. Fr. Lich. Scand. (1871) p. 73 (excl. **Cl. bacilliformi*).

Exs. Hepp Flecht. Eur. VI (1857) n. 294. — Koerb. Lich. Select. Germ. V (1857) n. 122. — Th. Fr. Lich. Scand. Exs. I (1859) n. 15. — Stenh. Lich. Suec. Exs. n. 200. — Norrl. et Nyl. Herb. Lich. Fenn. IX (1882) n. 418. — Rehm Clad. Exs. (1888) n. 347. — Arn. Lich. Exs. (1896) n. 1607 a, b. — Havaas Lich. Norv. Exs. (1902) n. 74. — Zahlbr. Krypt. Exs. Vindob. XIX (1911) n. 1868.

Icon. Sturm Deutschl. Fl. 7 II Abth. 24 H. (1832) tab. 13 d. — Arn. Lich. Exs. (1888) n. 1269, 1354.

Podetia elongata aut rarius *mediocria*, *ascypha* aut raro *scyphifera* *scyphisque* angustis irregularibusque instructa, simplicia aut varie ramosa, vulgo sterilia, soresiosa, decorticata aut parte inferiore corticata.

Distr. Supra muscos aliasque plantas destructas in rupe locis subumbrosis subhumidisque et terram obtegentes in pinetis atque turfosis, raro ad lignum putridum in pinetis crescit. Sat rara toto territorio. Ab.: Pyhänsuu in Pargas (K. Linkola). N.: Helsingforsia (J. P. Norrlin), Elgö ad Tvärminne (K. Linkola). Ka.: Vasikkasaari in Koivisto (E. Nylander), Luunusaari in Kakki (C. E. Boldt). Ta.: Tammela (A. Kullhem), Laaso (Norrl.) et Hersala (Vain.) in Hollola, Vanhoinen in Luhanka (Vain. Fl. Tav. Or. p. 95). Oa.: Simsiö in Lapua (V. Räsänen). Tb.: Vuoritsalo in Jyväskylä (K. Linkola). Sb.: Levämäki ad Kuopio (K. Linkola). KOneg.: Nikolski Ostrov (A. Kullhem). OKaj.: Saukko in Kianta (Vain. Adj. Lich. Lapp. I p. 103). Ob.: Alkkula (E. Nylander). Kuusamo: In reg. abietina montis Näränkävaara et in reg. subalpina montium Mäntytunturi, Ukonvaara et Iivaara (Vain. l. c.). LKem.: Ad Venejoki in Kittilä (G. Lång), Muonio in par. Muonioniska (Norrl.). LEnont.: In reg. silvatica ad

Saarenpää prope Könkämäeno (G. Lång, Zahlbr. l. c.). Lln.: In reg. pinifera montis Ruoptuinvaara (Vain. l. c.). Circa Puolmak in Finmarkia (Th. Fr. L. Sc. Exs. n. 15).

Thallus primarius demum evanescens, squamis esorediosis aut margine subtusve marginem versus sat parce farinoso- aut granuloso-sorediosis, KHO dilutissime lutescentibus aut non reagentibus, cum CaCl_2O_2 superne subtusque lutescentibus. Podetia long. 80—30 (20—100) mm, crass. 3—0.5 mm, simplicia aut furcata aut irregulariter varieve ramosa ramulosave, apicibus sterilibus subulatis aut obtusis, fere tota aut solum apicem versus sorediosa aut sorediis derasis partim denudata (rarove tunc tota esorediosa), sorediis farinosis vulgoque crebris, squamis destituta aut rarius basin versus sat parce squamosa squamulosave, straminea aut raro stramineo-albida aut cortice interdum stramineo-glauescente, apice sat diu accrescentia et basi demum simul emorientia, partibus emorientibus vulgo cyanescentibus aut demum fusciscentibus obscuratisve, parietibus crass. 0.060—0.340 mm, KHO dilutissime lutescentia aut fere non reagentia, addito CaCl_2O_2 distincte lutescentia, sec. Zopf (Ann. d. Chem. 313 p. 330, Flechtenst. p. 108, 408, Beitr. Chem. Mon. Clad. p. 102) et Salkovski (Ann. d. Chem. 314 p. 103) acidum laevo-usnicicum continentia. Apothecia subpeltata, convexa aut convexuscula, pallida aut testaceo-pallida, epruinosa. Sporae oblongae aut fusiformi-oblongae aut ovoideae, long. 0.008—0.011, crass. 0.0025—0.002 mm. Conidangia breviter subcylindrica aut ovoideo-cylindrica, crass. 0.240—0.130 mm, basi non aut levissime constricta, nigra aut fusciscentia. Conidia cylindrica, parce etiam subfusiformi-cylindrica, leviter curvata, long. 0.008—0.005, crass. 0.0005—0.001 mm.

Obs. *F. Despreauxii* (Bory) Th. Fr. Lich. Scand. (1871) p. 74, Vain. l. c. II p. 437, III p. 262. *Cl. Despreauxii* (Bory) Tuck. Syn. Lich. New. Engl. (1848) p. 53 (*Cenomyce Despreauxii* Bory in sched.). Podetia praesertim apice ramosa. Saepe inter podetia simplicia (f. *simplex* Wallr.) crescens, raro etiam abundantius obviam. — *F. campestris* Vain. l. c. III p. 262 (II p. 436), podetiis albidis, KHO cum CaCl_2O_2 lutescentibus, instructa, in reg. subalpina montis Ukonvaara in Kuusamo (Vain.). — *F. connectens* Vain., podetiis elongatis, scyphiferis, scyphis angustis, irregularibus, radiatis dentatisve, radiis dentibusque subulatis, sterilibus aut conidiiferis. Est forma intermedia inter *Cl. carneolam* et **Cl. cyanipedem*, in posteriorem autem transiens (conf. Vain. l. c. II p. 423). Supra Hypnum Schreberi et Dicranum in Nikolski Ostrov in Karelia Onegensi abundanter (A. Kullhem). *F. scyphifera* Norrl. e **Cl. bacilliformi* evoluta huic est analoga (videas p. 122).

2. *Pilophoron* (Tuck.) Nyl.

Syn. Lich. (1860) p. 228 tab. VII f. 4—6; Stizenb. Beitr. Flechtensyst. (1862) p. 166; Vain. Etud. Lich. Brés. I (1890) p. 67; Reinke Abh. Flecht. III et IV (1895) p. 124, f. 47; Zahlbr. Ascol. (1905) p. 140, 142. *Stereocaulon* sect. *Pilophoron* Tuck. Syn. Lich. New. Engl. (1848) p. 46. *Pilophorus* Th. Fr. De Ster. Piloph. Comm. (1857) p. 40, Mon. Ster. (1858) p. 68, tab. 4 f. 2—4, tab. 10 f. 5, Gen. Heterol. (1861) p. 77, Lich. Scand. I (1871) p. 55; Tuck. Suppl. En. North Am. Lich. (1858) p. 426, Gen. Lich. (1872) p. 145; Forssell Stud. Cephalod. (1883) p. 75; Cromb. Mon. Brit. Lich. I (1894) p. 114, fig. 32 (Nyl. delin.).

Thallus primarius crustaceus, verrucosus aut areolatus, strato corticali haud evoluto. Apothecia apicibus podetiorum affixa, mox convexa immarginataque, gonidiis destituta. Podetia simplicia aut ramosa, strato medullari gonidia continente, verrucoso areolatove obducta, strato corticali destituta, intus strato chondroideo, ex hyphis pachydermaticis, longitudinalibus, conglutinis formato, instructa, solida aut fistulosa aut stratum medianum, ex hyphis laxissime contextis formatum, continentia. Perithecium tantum ex hypothecio constans. Hypothecium in parte superiore stratum formans fuscum, hyphis erectis, conglutinis, sat leptodermaticis, strato chondroideo, ex hyphis irregulariter contextis, pachydermaticis, conglutinis formato, impositum. Paraphyses simplices. Asci clavati, leptodermatici. Sporae 8-nae, decolores, fusiformes oblongaeve, simplices. Conidia apicibus podetiorum affixa. Sterigmata breviter, simplicia aut parce ramosa, exarticulata aut septis paucis, apicibus conidia efferentibus. Conidia cylindrico-filiformia aut subfalcata, tenuia, recta aut leviter curvata (sec. Nyl. et Arn.).

Primordia podetiorum e partibus interioribus areolarum verrucarumque thalli primarii excrescentia (quod in *P. cereolo* observavi), nec e verrucis thalli longitudine accrescentibus, ad instar pseudopodetiorum *Stereocaulorum*, formata. Evolutione et textura *Pilophoron* igitur magis simile est *Cladoniae* et *Baeomycei*, quam *Stereocaulo*.

1. *P. cereolus* (Ach.) Nyl.

in Stizenb. Ind. Lich. Hyperb. (1876) p. 10. *Lichen (Isidium) cereolus* Ach. Lich. Suec. Prodr. (1798) p. 89. *Stereocaulon* Ach. Meth. Lich. (1803) p. 316, tab. 7 f. 2, Lich. Univ. (1810) p. 582; Floerk. Deutsch. Lich. IV (1819) p. 14. *Pilophorus robustus* **P. cereolus* Th. Fr. Lich. Scand. I (1870) p. 55; Forssell Stud. Cephalod. (1883) p. 76. *Pilophorus cereolus* Arn. Lich. Tirol XXIII (1887) p. 83; Cromb. Mon. Brit. Lich. I (1894) p. 114, fig. 32 a, b, c (Nyl. delin.); Lynge Norske Busk- Bladlaver (1910) p. 44, Stud. Lich. Norw. (1921) p. 28. *Stereocaulon cereolinum* β . *Cereolus* Th. Fr. De Ster. Piloph. Comm. (1857) p. 19, Mon. Ster. (1858) p. 40. *Stereocaulon cereolinum* Ach. Syn. Lich. (1814) p. 285 p. p. *St. condensatum* **St. cereolinum* Nyl. Syn. Lich. (1860) p. 250 p. p., Lich. Scand. (1861) p. 66 p. p. *Pilophoron fibula* Nyl. in Norrl. Bidr. Sydöstr. Tav. Fl. (1870) p. 176, Ber. Torn. Lappm. (1873) p. 321, cet.; Vain. Fl. Tav. Or. (1878) p. 96 (haud Tuck., conf. p. 128).

Exs. Un. Itiner. (1867) n. 31 (sec. Arn. l. c.). — Arn. Lich. Exs. (1880) n. 823, 868 (cum paras.), (1885) n. 1088. — Zwackh Lich. Exs. (1883) n. 817, 818 (sec. Arn.). — Lojka Lich. Regn. Hung. IV (1884) n. 179. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 499, 500.

Podetia brevia, simplicia aut raro apice parcissime ramosa, sorediosa aut partim verrucis areolisve gonidia continentibus obducta aut tota verrucosa, vulgo sterilia. Apothecia basi abrupte constricta, latere leviter inflexo, nigra. Hymenium superius aeruginosum.

Distr. Locis apricis aut subumbrosis ad rupes, scopulos et saxa dioritica et granitica sat rare aut passim in maxima parte territorii, septentrionem versus rarescens. LIn: Muddusjärvi (F. Silén). LENont.: „In declivo ferroso-arenoso duro umbroso ad Peerakoski“ (Norrl. Ber. Torn. Lappm. p. 321), in reg. alpina montis Leutsuvaara (Norrl. l. c.). LKem.: In reg. abietina montis Väливаара prope Pallastunturi in Kittilä (Norrl. l. c.), Pyhäkuru in Kuolajärvi (H. Lindberg). Kuus.: Paanajärvi (F. Silén), ibi etiam in Vaskikallio (Vain.) et in reg. subalp. montium Mäntytunturi et Iivaara (Vain. Adj. Lich. Lapp. I p. 99). OKaj.: Nonnullis locis prope Kymälä in Kuhmo (Vain. l. c.). Kb.: Passim, velut ad Vieki et Matovaara in par. Lieksa et ad Mujejärvi et Nuottivaara in par. Nurmes (Vain. l. c.). Kar. Vien. occ.: Koroppi in Repola (Vain.). Tb.: Pihlajavesi (Norrl.). Sb.:

Karttula (E. Nylander), Mustalahti in Kuopio (K. Linkola, G. Lång l. c.), Pieksämäki (Norrl. H. L. F. n. 500). KOn.: „Ad saxa, praesertim dioritica, satis frequenter per totum territorium“ (Norrl. Fl. Kar. Oneg. II p. 11). Ta.: Piililä et Haukkavuori in Korpilahti, Onkisalo et Hietala in Luhanka (Vain. Fl. Tav. Or. p. 96), Kuhmo, Evo, Padasjoki, Asikkala, Hollola (Norrl. Bidr. Sydöstr. Tav. Fl. p. 176, Vain., G. Lång), Mustiala et Särkijärvi in Tammela (A. Kullhem). Ab.: Kuusto (A. Kullhem).

Thallus primarius sat tenuis, verrucis areolisque 0.3—0.15 (—0.5) mm latis, contiguus, albido-glauculentibus, KHO lutescentibus, saepe partim parceque sorediosis, hypothallo parum evolutu albidoque, effuso, aut indistincto, parathallis (cephalodiis) verrucas formantibus 1—0.2 mm latas, convexas vel tuberculosas, basi constrictas, subfuscescentes aut pallido-fuscescentes aut pallidas, crebras aut dispersas, quae continent algas cyanophyceas, cellulis moniliformi-concatenatis, glomeruloso-intricatis, subglobosis aut ellipsoideis, diam. 0.003—0.004 (—0.005) mm. Podetia dispersa aut sat crebra, long. 2—5, crass. 0.2—0.9 mm, albido-glauculentia, KHO lutescentia, praesertim apicem versus aut fere tota sorediosa, fertilia esorediata aut partim sorediosa, sorediis albidis aut impure albidis, verruculis verrucisque contiguus, strato chondroideo decolore, ex hyphis formato longitudinalibus, pachydermaticis, conglutinis (tubulo tenui instructis), medio leviter lacerato et fissuris pluribus angustis, hyphas arachnoideas parum aut vix ullas continentibus, instructo, strato myelohyphico circ. 0.080—0.120 mm crasso, toto crebre contexto et gonidia continente aut partim inter stratum chondroideum et zonam gonidiale zonam arachnoideam rudimentariam formante. Apothecia lat. 0.8—1 mm, hemisphaerica, convexa. Hypothecium in parte superiore hyphis erectis, sat leptodermaticis, 0.003 mm crassis, conglutinis, fuscis instructum, in parte inferiore dilutius fuscescens, sat pachydermaticum, irregulariter contextum. Hymenium circ. 0.050—0.060 mm crassum, jodo caerulescens. Sporae „fusiformes oblongaeve, apicibus obtusis aut sat acutis, long. 0.016—0.022, crass. 0.0045—0.005 (—0.007) mm“ (sec. annot. Nyl.). Conidangia apicibus podetiorum affixa solitariaeque, conoidea aut cylindrica, nigricantia, ostiolo parvo. Conidia long. 0.005—0.006, crass. 0.0015 mm, curvula, subfalcata (sec. Arn. l. c.), filiformi-cylindrica, recta aut leviter curvata (sec. Nyl. in Cromb. l. c.). Gonidia pleurococcoidea, simplicia aut glomerulosa, parce 2-cellulosa (4-cellulosa non visa), subglobosa aut globosa, diam. 0.007—0.012 mm, membrana leviter incrassata aut sat tenui.

Obs. 1. *Pilophoron fibula* (Tuck.) Nyl. Syn. Lich. (1860) p. 229, tab. VII f. 6 (*Stereocaulon fibula* Tuck. Syn. Lich. New Eng., 1848, p. 46), sec. specim. orig. n. 39758 in herb. Nyl. thallo primario et podetiis haud sorediosis, podetiis semper fertilibus (aut conidiiferis) et apotheciis latere haud inflexo, sporis „long. 0.016—0.027, crass. 0.007—0.010 mm“ (sec. annot. Nyl.) a *P. cereolo* differt.

Obs. 2. *Pilophoron robustum* (Th. Fr.) Nyl. Lich. Scand. (1861) p. 62 (*Pilophorus robustus* Th. Fr. De Ster. Piloph. Comm., 1857, p. 111, Lich. Scand. I p. 55), etiam in Storfjeldet supra Mortensnaes ad Sinum Varangerfjord in Finmarkia a Th. Fr. collectum (Th. Fr. Lich. Scand. Exs. I, 1859, n. 11), podetiis longioribus (10—25 mm longis), esorediatis, in caespites parvos confertis, vulgo fertilibus, apicem versus in ramos breves subcorymbose divisus, apotheciis latere haud inflexo a *P. cereolo* distinguitur.

Subtrib. 2. **Lecideaceae** Vain.

Thallus squamosus aut crustaceus, gonidia continens pleurococcoidea aut cystococcoidea aut in iisdem speciebus in parathallis (cephalodiis) simul etiam cyanophyceae, praesertim scytonemeae [aut in generibus ad fungos pertinentibus e mycelio gonidiis destituto constans]. Apothecia sessilia aut raro stipite brevissimo instructa aut thallo immersa (sed etiam tunc perithecio gonidiis destituto instructa).

Lecideaceis plura genera *Pezizearum* affinia sunt.

I. Sporae septis divisae.

A. Sporae strato gelatinoso haud indutae.

a. Sporae bacillares acicularesve, tenues longaeque.

1. **Toninia.** Thallus squamulosus aut ex areolis crenulatis lacunulatisve aut e verrucis proliferis constans.

3. **Bacidia.** Thallus crustaceus, uniformis.

β. Sporae comparate crassae et breves aut sat breves.

† Sporae transversim septatae.

△ Thallus squamosus.

2. **Thalloedaema.** Sporae ellipsoideae aut elongato-oblongae aut fusiformes, 1—3-septatae.

△△ Thallus crustaceus.

○ Sporae 3—pluri-septatae.

4. **Bilimbia.** Sporae fusiformes aut oblongae elongatae, decolores.

○○ Sporae 1-septatae.

7. **Catillaria.** Ad corticem arborum aut ad muscos, terram aut saxa crescentes. Sporae decolores. Thallus gonidia continens.

[**Scutula.** Parasitae lichenum. Sporae decolores. Mycelium gonidiis destitutum. Ad Fungos pertinentes.]

†† Sporae murales, septis transversis et longitudinalibus divisae.

5. **Sporopodium.** Sporae decolores aut pallidae obscurataeve. B. Sporae strato gelatinoso indutae.

6. **Rhizocarpon.** Sporae 1—3-septatae aut murales, decolores aut obscuratae.

II. Sporae simplices.

× Sporae 8-nae aut raro — 16-nae aut — solitariae.

8. **Lecidea.** Saprophytae aut ad terram aut ad saxa crescentes. Sporae ellipsoideae oblongaevae aut raro globosae, mediocres aut parvae. Thallus gonidia continens.

[**Nesolechia.** Parasitae lichenum. Sporae decolores. Mycelium gonidiis destitutum. Ad Fungos pertinentes.]

×× Asci polyspori. Sporae minutissimae aut raro parvae.

9. **Biatorella.** Thallus gonidia continens.

[**Tromera.** Mycelium gonidiis destitutum. Ad Fungos pertinentes.]

1. **Toninia** (Mass.) Koerb.

Syst. Lich. Germ. (1855) p. 182; Mass. Ric. Lich. Crost. (1852) p. 107 p. p. *Lecidea* subg. *Toninia* Vain. Etud. Lich. Brés. II (1890) p. 9. *Toninia* **Eutoninia* Th. Fr. Lich. Scand. II (1874) p. 330 p. p.

Thallus squamulosus aut ex areolis crenulatis lacinulatisve aut e verrucis prolificantibus constans. Apothecia sessilia. Sporae 8-nae, decolores, tenues, longae, bacillares acicularesve, 3—pluri-septatae. Gonidia ad *Cystococcum* pertinentia.

A. Hypothecium pallescens aut decoloratum.

† Hypothallus radiceformis.

1. **T. squalida** (Schleich.) Mass. Thallus squamis rugosis, 1.5—0.5 mm latis. 130.

T. verruculosa (Th. Fr.) Vain. Thallus verruculis 0.5—0.2 mm latis, proliferationibus glomerulos crassos formantibus. 131.

†† Hypothallus haud radiceforme elongatus.

T. cinereo-virens (Schaer.) Mass. Thallus squamis olivaceo-fuscescentibus, saepe albido-marginatis. 132.

B. Hypothecium obscure fuscescens.

2. **T. aromatica** (Turn.) Mass. Thallus squamis testaceo- aut rarius subolivaceo-luridis. 133.

3. **T. fusispora** (Hepp) Th. Fr. Thallus squamis albidis vel cinerascens. 134.

1. **T. squalida** (Schleich.) Mass.

Ric. Lich. Crost. (1852) p. 108; Koerb. Syst. Lich. Germ. (1855) p. 182; Th. Fr. Lich. Arct. (1860) p. 172. *Lichen squalidus* Schleich. Pl. Crypt. Helv. Cent. III (1807) p. 75 (in herb. Ach.). *Lecidea squalida* Ach. Lich. Univ. (1810) p. 169, Syn. Lich. (1814) p. 19; Fr. Lich. Eur. Ref. (1831) p. 288; Nyl. Prodr. Lich. Gall. (1857) p. 368 (122), Lich. Scand. (1861) p. 216; Norrl. Ber. Torn. Lappm. (1873) p. 348, Fl. Kar. Oneg. II (1876) p. 32, Symb. Fl. Ladog.-Kar. (1878) p. 29; Vain. Adj. Lich. Lapp. II (1881) p. 4. *Toninia* Arn. Lich. Fragm. XXIV (Fl. 1881) p. 175 (17). *Lecidea atrorufa* b. *squarrosa* Ach. Vet. Ak. Handl. 1808 p. 267, Lich. Univ. (1810) p. 200. *Toninia squarrosa* Th. Fr. Lich. Scand. II (1874) p. 331; Arn. Lich. Fränk. Jur. (Fl. 1884) p. 147. *Lecidea norvegica* Sommerf. Suppl. Fl. Lapp. (1826) p. 175.

Exs. Nyl. Lich. Mont-Dor. (1856) n. 50. — Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 190. — Havaas Lich. Exs. Norv. (1905) n. 286. — Malmé Lich. Suec. Exs. XV (1913) n. 356.

Thallus squamis rugosis plicatisque, crenatis lobatisque, circ. 1.5—0.5 mm latis, difformibus, convexis aut planis, cinereo-fuscescentibus aut rarius cinerascens pallidisve, proliferationibus numerosis demum in acervulos aggregatis, acervuli radici sive hypothallo radiceformi communi elongato affixi. Apothecia primum plana, saepe demum convexa, nigra, nuda. Hypothecium decoloratum aut sublutescens pallidumve. Sporae aciculares, long. 0.025—0.044 (0.018—„0.052“ sec. Nyl.), crass. 0.003 (—0.0045) mm.

Distr. Supra muscos destructos et detritum rupium et terram arenosam calcariamque in rupibus, praesertim schistosis. KLad.: Kirjavahti (J. P. Norrlin). KOn.: In monte Valkeamäki vel Tiudie (A. Kullhem), in promontorio Ascheb (Norrl.). OKaj.: Suomussalmi (F. Silén). Kuus.: In reg. subalpina montis Iivaara (Vain.), ad Kitkajoki (F. Silén). LTul.: Ad sinum Kuollaensem (N. I. Fellman, „L. bacillifera var. muscorum f. alpina“ Nyl. Lich. Lapp. Or. p. 156).

Squamae modice incrassatae, haud albido-marginatae. Hypothallus albidus. Apothecia primum margine sat tenui, haud aut leviter prominente, dein mox excluso, sparsa aut vulgo conferta, saepe etiam confluentia, demum haud raro varie lobata, lat. 0.5—2.3, crass. circ. 0.4 mm, opaca. Perithecium extus purpureo-nigricans aut cyanescens vel subaeruginosum, intus pallidum albidumve, KHO non reagens. Hypothecium crassum, KHO non reagens. Hymenium crass. circ. 0.06 mm, „jodo vinose rubens“ (sec. annot. Nyl.) aut „primum caerulescens, praesertim apice ascorum“ (sec. Th. Fr.). Epithecium cyanescens aut aeruginoso- aut olivaceo- aut fusciscenti-nigricans, KHO non reagens. Paraphyses crassiusculae, apice clavatae, sat laxae aut sat arcte cohaerentes. Sporae rectae aut raro leviter curvatae, vulgo tantum altero apice leviter attenuatae, 3—5-septatae (rarius — 7-septatae sec. Th. Fr.). Conidia „acicularia, gracillima, varie curvata“ (sec. Th. Fr.).

Obs. Ab hac specie non differt *T. caulescens* Anzi Cat. Lich. Sondr. (1861) p. 67, Lich. Rar. Langob. Exs. IV (1861) n. 139.

T. verruculosa (Th. Fr.) Vain.

Toninia cinereovirens β . *verruculosa* Th. Fr. Lich. Scand. II (1874) p. 331; Malme Lich. Suec. Exs. XVII (1914) n. 410.

Thallus squamuloso-verruculosus, verruculis 0.5—0.2 mm latis, cinereis aut obscure cinerascentibus, convexis aut partim vertice subconcavo, demum creberrime proliferus et glomerulos 1—5 mm latos, crassos, stipitados formans, hypothallo radiciformi, demum elongato. Apothecia adnata adpressaque, basi constricta, plana aut demum leviter convexa, subpersistenter marginata, vulgo demum conferta, nigra, nuda. Hypothecium albidum. Sporae bacillares, long. 0.018—0.024, crass. 0.003 mm.

Distr. Ad terram arenosam loco calcario in jugo alpino Norvegico inter Kilpisjärvi et Lyngen (J. P. Norrlin, „L. conglomerata“ sec. Nyl. in Norrl. Ber. Torn. Lappm. p. 347), ster. Etiam aliis locis in Norvegia et in Suecia collecta.

Facie externa *Th. conglomeratum* in memoriam revocans et facile a *T. cinereovirente* distincta. Thallus opacus, glomerulis hypothallo albido fragili substrato sat laxae affixus. Apothecia margine modice incrassato, haud aut parum prominente, circ. 0.7—2 mm lata, opaca. Perithecium extus subviolaceo-fuligineum, intus dilute subrubricosofusculum, ex hyphis formatum radiantibus, conglutinatis, membranis modice incrassatis, cavitatibus cellularum oblongis, 0.003 mm latis. Hypothecium in parte angusta superiore hyphis suberectis, inferne

irregulariter contextis, membranis modice incrassatis, conglutinatis, cavitatibus angustis. Hymenium 0.065—0.080 mm crassum, jodo caerulescens. Epithecium fuscofuligineum aut inferne subcyanescentinigricans. Partes obscuratae apotheciorum KHO pulchrius violascentes. Paraphyses sat arcte cohaerentes, increbre septatae, simplices, crass. 0.002 mm, apice 0.004 mm clavataeque. Sporae 8-nae, polystichae, bacillares, apicibus rotundatis obtusisve, rectae, 3-septatae.

T. cinereovirens (Schaer.) Mass.

Ric. Lich. Crost. (1852) p. 107; Koerb. Syst. Lich. Germ. (1855) p. 182; Th. Fr. l. c. (excl. var. et cit.). *Lecidea* Schaer. Lich. Helv. Spic. III (1828) p. 109; Fr. Lich. Eur. Ref. (1831) p. 286; Nyl. Prodr. Lich. Gall. Alg. (1857) p. 368 (122). *Biatora imbricata* Hepp Flecht. Eur. III (1860) n. 735 (haud *Lecidea imbricata* Mont. Ann. Sc. Nat. 2, XVI, 1841, p. 125). *Toninia imbricata* Koerb. Lich. Sel. Germ. XI (1868) n. 312; Arn. Lich. Tirol VIII (1872) p. 290.

Thallus squamis subrotundatis, diam. circ. 1—0.3 mm, subintegrus aut parce lobatis subcrenatisve, planis, confertis et partim subconfluentibus, sat tenuibus vel modice incrassatis, demum prolificantibus et crustam areolatam 0.5—1.5 mm crassam formantibus, superne obscure olivaceo-fuscescentibus, opacis, basi haud radiciformi-elongata affixus. Apothecia plana aut demum depresso-convexa, nigra. Hypothecium decoloratum aut sublutescens. Sporae aciculares, „long. 0.018—0.032, crass. 0.003—0.004 mm“ (sec. Th. Fr. l. c. et annot. Nyl.).

Distr. Ad terram calcariam et rupes in Suecia et Norvegia provenit, sed in Fennia nondum est collecta.

Thallus distincte squamosus, squamis planis, saepe albido-marginatis. Hypothallus albidus. Apothecia primum margine sat crasso, prominente, demum immarginata, sparsa aut conferta, saepe demum angulosa vel varie lobata, lat. 1.5—0.7 („—2“) mm, nigra nudaque aut raro tenuissime pruinosa, opaca. „Paraphyses validiusculae, laxius cohaerentes, apice fuligineo-capitatae. Sporae 4—8-blastae, utrinque vel altero apice subattenuatae. Hymenium jodo praecedente caerulescentia levi vinose rubet. Perithecium extus atropurpureum, intus pallidius. KHO paraphyses minus intense, exterior excipuli pars laetius violascit“ (sec. Th. Fr. l. c.). Conidia „filiformia, bene arcuata, long. 0.018—0.024, crass. non 0.001 mm“ sec. annot. Nyl. in herb. suo.

Obs. *Lecidea imbricata* Mont., l. c., 1841, p. 125, Syll. Crypt. (1856) p. 341, „apotheciis intus fuscis, sporis oblongo-subcymbiformibus bilocularibus“ descripta, ad rupes maritimas prope urbem Cayennam in America merid. collecta, ad *T. cinereovirentem* (Schaer.) sec. descr. pertinere non videtur. Conf. etiam Stizenb. Lich. Helv. (1882) p. 175.

2. *T. aromatica* (Turn.) Mass.

Symm. Lich. (1855) p. 54; Th. Fr. Lich. Scand. II (1874) p. 332. *Lichen aromaticus* Turn. in Sm. Engl. Bot. XXV (1807) tab. 1777 (sec. specim. orig. in herb. Ach.). *Lecidea aromatica* Ach. Lich. Univ. (1810) p. 168, Syn. Lich. (1814) p. 19. *Lecidea acervulata* Nyl. in Bot. Not. 1853 p. 183 (sec. specim. orig.), Lich. Scand. (1861) p. 216. *Toninia acervulata* Krempelh. Lich. Bay. (1861) p. 185; Arn. Lich. Tirol XI (1873) p. 498 (14), XIII (1874) p. 270 (40).

Thallus subverrucoso-squamosus, squamis depresso-convexis planiusculisve, saepe demum verruculoso-inaequalibus, margine haud raro demum crenulatis, circ. 1—0.3 mm latis, vulgo demum confluentibus, modice incrassatis, superne testaceo- aut rarius subolivaceo-luridis, hypothallo parum aut bene evoluto, haud radiciformi. Apothecia aggregata aut subdispersa, plana, margine sat tenui, saepe demum convexa immarginataque, nigra, nuda. Hypothecium purpureo- aut fuscescenti-fuligineum. Sporae variabiles, bacillares, oblongae et fusiformes saepe in eodem apothecio, apicibus rotundatis obtusisve, long. 0.16—0.030 („—0.036“ sec. annot. Arnoldi in herb. Nyl.), crass. 0.003—0.004 (—0.006) mm.

Distr. Ad terram arenosam muscosque locis calcariis et in rupe talcacea. KLad.: Korpikallio (J. P. Norrlin, „L. acervulata“ sec. Nyl. in Norrl. Symb. Fl. Ladog.-Kar. p. 29) et Lapidina marmorea („L. austerula“ sec. Nyl. in Norrl. l. c.) in Ruskeala. KOn.: In monte Valkeamäki (Norrl., „L. acervulata“ sec. Nyl. in Norrl. Fl. Kar. Oneg. II p. 32). Kuus.: Ad Kitkajoki (F. Silén), Paloniemi prope Paanajärvi („v. acervulata“ (Vain. Adj. Lich. Lapp. II p. 4).

Thallus haud pruinosis. Apothecia adnata, basi vulgo leviter constricta, opaca, margine haud aut leviter prominente. Perithecium violaceo- vel purpureo-fuligineum vel subfuscescens, KHO distinctius purpureum. Hypothecium crassum, in parte superiore cavitatibus cellularum anguloso-rotundatis, 0.003 mm latis, membranis sat tenuibus, ceterum cartilagineum, vulgo totum purpureo- aut subfuscescenti-fuligineum, materia colorante praesertim in limite hypharum disposita, KHO distinctius purpureum, raro parte inferiore pallidum. Hymenium circ. 0.060 mm crassum, parte inferiore saepe dilute subrubiginosum, jodo cae-

rulescens, dein vinose rubens. Epithecium aeruginoso-nigricans, KHO non reagens. Paraphyses sat laxae cohaerentes, apice clavatae. Sporae 3-septatae.

Obs. *Lichen aromaticus* Turn. et *Lecidea acervulata* Nyl. sec. specimina orig. nulla nota differunt.

3. *T. fuispora* (Hepp) Th. Fr.

Lich. Spitsb. (1867) p. 34, Lich. Scand. II (1874) p. 334. *Biatora* Hepp Bündn. Jahresb. VI (1860) p. 245. *Rhaphiospora* Koerb. Parerg. Lich. 3 Lief. (1861) p. 237. *Lecidea* Nyl. in Stizenb. Ind. Lich. Hyperb. (1876) p. 40. *L. sabuletorum* f. *fuispora* Stizenb. Lec. Sab. (1867) p. 41, tab. II f. 105—107.

Thallus verrucoso-subsquamulosus, squamis vulgo convexis, albidis vel cinerascens, circ. 0.2—0.5 mm latis, hypothallo indistincto. „Apothecia thallo adnata, conferta, opaca, atra, lat. —0.8 mm, primitus plana, elevato-marginata, mox convexa immarginataque. Lamina brevis, superne nigro-viridula. Hypothecium crassum, obscure fuscum, paraphysibus latioribus. Epithecium olivaceum aut nigroviridulum. Sporae subclavatae aut subaciculari-fusifformes, 1—3-septatae, long. 0.017—0.030, crass. 0.003 (—0.006) mm“ (sec. Koerb. et Stizenb. l. c.).

Distr. Ad saxum graniticum in insula Pöppönsaari in Suojärvi KOn. (J. P. Norrlin, „*L. austerula*“ sec. Nyl. in Norrl. Fl. Kar. Oneg. II p. 31).

Obs. *Lecidea austerula* Nyl. in Fl. 1873 p. 20 his verbis describitur: „Subsimilis *L. subincomptae*, sed thallo (fusco-nigricante) areolato, sporis brevioribus (3-septatis, long. 0.015—0.018, crass. 0.0035 mm)“. Sec. specim. orig. (n. 17393 a) in herb. Nyl. e Pöppönsaari thallus albidocinerascens (in mus. Fenn. morbosus obscuratusque), areolis 0.5 mm latis, convexis, apothecia lat. 0.4—0.6 mm, sat crebra, haud aggregata, primum plana et tenuiter marginata, dein depresso-convexa, crass. 0.2 mm, hymenium 0.040—0.035 mm crassum, epithecium aeruginoso-fuligineum, KHO non reagens, hypothecium fuscofuligineum, parte superiore KHO purpureum, ibi etiam plectenparenchymaticum, sat leptodermaticum, cavitatibus anguloso-rotundatis, 0.003—0.0015 mm latis, subhorizontaliter aut sat irregulariter dispositis, ceterum cartilagineum, cavitatibus oblongis, tenuibus, materia colorante praesertim in limite hypharum pachydermaticarum. Perithecium pachydermaticum, violaceo-fuligineum, KHO distinctius purpureum. Paraphyses arcte cohaerentes,

crass. 0.0015 mm, apice clavatae, crass. 0.0025 mm, septatae. Sporae oblongae aut bacillares, 3-sept., long. 0.014—0.016, crass. 0.003—0.0035 mm, apicibus obtusis. Gonidia globosa, diam. 0.008—0.016 mm, simplicia aut raro 2-cellulosa, membrana sat tenui. Non sit distinguenda a *T. fusispora*. — In *T. fusispora* sec. Th. Fr. „hymenium jodo caerulescit, dein vinose rubet, epithecium KHO non mutatur, hypothecium peritheciumque violascunt, conidia acicularia, valde curvata“. In *T. aromaticam* transire videtur.

2. *Thalloedaema* Mass.

Vain. Etud. Lich. Brés. II (1890) p. 18. *Thalloidima* Mass. Ric. Lich. Crost. (1852) p. 95; Koerb. Syst. Lich. Germ. (1855) p. 178; Th. Fr. Gen. Heterol. (1861) p. 80. *Toninia* **Thalloedema* Th. Fr. Lich. Scand. II (1874) p. 336.

Thallus squamulosus aut ex areolis crenulatis lacinulatisve aut e verrucis prolificantibus constans aut ambitu effiguratus. Apothecia sessilia. Sporae 8-nae, decolores, minores, breves aut sat breves, ellipsoideae aut oblongae vel elongato-oblongae aut fusiformes, 1—3-septatae. Gonidia cystococcacea.

A. Thallus ambitu et medio uniformis.

a. Sporae 1-septatae.

§ Hypothecium saltem superne rubricosum obscuratumve.

△ Thallus aut apothecia saltem partim pruinosa.

1. **Th. caeruleonigricans** (Lightf.) Poetsch. Thallus squamis apice convexus. Hypothecium superne fuscescens aut intense rubricosum. 136.

Th. candidum (Web.) Mass. Thallus ad ambitum squamis applanatis. Hypothecium superne dilute rubricosum. 138.

△△ Thallus et apothecia haud pruinosa.

2. **Th. triste** (Th. Fr.) Vain. Thallus tabacinus. 140.

§§ Hypothecium pallidum aut decoloratum.

Th. squalescens (Nyl.) Vain. Thallus squamulis convexus, proliferis, cinerascentibus, haud pruinosis. 139.

Th. conglomeratum (Ach.) Mass. Thallus squamulis planiusculis concaviusculisve, proliferis, pallidis aut cinerascentibus, margine subalbido- aut subcaesio-pruinoso. 145.

β. Sporae partim 3-septatae.

3. **Th. syncomistum** (Floerk.) Vain. Squamulis in crustam verruculoso-inaequalem confluentibus. 141.

B. Thallus ambitu lacinulato-effiguratus, lacinulis angustis, medio crustaceus.

4. *Th. cumulatum* (Sommerf.) Vain. Apothecia in acervulos creberrime aggregata. 143.

1. *Th. caeruleonigricans* (Lightf.) Poetsch.

Thalloidima caeruleonigricans Poetsch Syst. Afz. p. 212 (sec. Th. Fr. l. c. p. 337); Arn. Lich. Fränk. Jur. (Fl. 1884) p. 145. *Lichen* Lightf. Fl. Scot. II (1777) p. 805. *Lecidea* Schaer. Lich. Helv. Spic. III (1828) p. 120. *Toninia* Th. Fr. Lich. Scand. II (1874) p. 336 p. p. *Patellaria vesicularis* Hoffm. Pl. Lich. II (1794) p. 30, tab. XXXII f. 3. *Lecidea* Ach. Meth. Lich. (1803) p. 78; Nyl. Lich. Scand. (1861) p. 214. *Thalloidima* Koerb. Syst. Lich. Germ. (1855) p. 179; Th. Fr. Lich. Arct. (1860) p. 174.

Exs. Fr. Lich. Suec. Exs. XI n. 313. — Stenh. Lich. Suec. Exs. n. 17. — Havaas Lich. Exs. Norv. (1908) n. 382.

Thallus verrucoso- aut demum subfruticuloso-squamosus, squamis majore parte erectis, simplicibus aut demum sublobato-ramosis, difformibus, apicibus saltem majore parte convexis inflatisque et demum fistulosis, demum stipitatus et in hypothallum radiceformem continuatus, superne pallido-olivaceus aut cinereo-glauescens, vulgo laevigatus, nudus aut plus minus pruinosis. Apothecia basi bene constricta, demum lata, plana aut rarius demum depresso-convexa, nigra, nuda aut partim caesio-pruinosa. Hypothecium superne late intense fuscescens aut (in var. atypicis) rubricosum. Sporae subfusiformes, 1-septatae.

Distr. Ad terram nudam et inter muscos supra rupes et in fissuris rupium locis calcariis rara in Fennia. Ab.: Insula Jurmo in par. Korpo (E. Nylander, „f. glebosa Ach.“ sec. W. Nyl.). KOn.: Tiudie (A. Kullhem), Valkeamäki (A. Kullhem, J. P. Norrlin, „L. vesicularis“ sec. Nyl. in Norrl. Fl. Kar. Oneg. II p. 22).

Squamae confertae, crustam crassam plus minus latam constituentes, superne laeves (aut raro strato corticali rimuloso-dehiscente, f. *dehiscens* Vain., ad Hardanger in Norvegia ab Havaas collecta), saepe verrucas difformes, circ. 2.5—0.5 mm latas formantes. Apothecia lat. 1—5 mm, margine primum prominente, modice incrassato, demum haud raro ex-

cluso, nudo aut pruinoso, disco opaco, nudo aut rarius p. p. pruinoso. „Excipulum extus pallidum vel tenuiter obscuratum, praeterea pallidum vel leviter fuscidulum, hypothecium rufescentifuscum vel demum nigrofuscum, paraphyses sat validae, laxius cohaerentes, apice fuligineae, KHO paraphysum apices et exterius excipuli stratum violascentia, hymenium jodo caerulescens, dein vinose rubens, sporae dyblastae, subfusiformes, long. 0.014—0.025, crass. 0.002—0.004 mm“ (sec. Th. Fr. l. c.). „Epithecium obscure sordide viride, KHO violascens“ (sec. Arn. Lich. Tirol XI, 1873, p. 498. In speciminibus a me in Helvetia collectis epithecium aeruginoso- aut subviolaceo-nigricans, KHO pulchre violascens, hypothecium parte superiore 0.040—0.050 mm crassa fusca (KHO non reagente) aut subviolaceo-nigricante, parte inferiore tenuiore albida, perithecium extus sordide subviolaceo- aut aeruginoso-nigricans, KHO plus minus distincte violascens, intus dilute subfuscenscens. Conidia „filiformia, arcuata, long. 0.014—0.018, crass. 0.001 mm“ (sec. annot. Nyl. in n. 20146, Arn. l. c. XVI, 1876, p. 403). Conidia ad Cystococcum pertinentia (sec. Chodat in Mater. Fl. Crypt. Suisse IV, 1913, fig. 162, pag. 191, 205, 221), globosa, simplicia et 2—4-cellulosa, pyrenoide instructa.

Obs. 1. Specimina omnia in Fennia collecta ad var. **subcandidam** Vain. pertinent, thallo bene pruinoso a var. **opuntioide** (Vill.) Nyl. (Circ. Lich. Armor. p. 400), quae thallo nudo instructa est, differentem. Apothecia parcius bene pruinosa, majore parte nuda. Perithecium ex hyphis radiantibus, sat leptodermaticis, conglutinatis, formatum, cavitatibus cellularum oblongis, circ. 0.003 mm latis, extus sordide violaceum, intus albidum. Hypothecium superne rubricosum aut rubricosum-rufescens, inferne albidum, chondroideum, irregulariter contextum, membranis modice incrassatis, conglutinatis. Hymenium circ. 0.075 mm crassum. Epithecium violaceo-nigricans, KHO pulchre violascens. Paraphyses sat arcte cohaerentes, increbre septatae, crass. 0.002, apice 0.003 mm. Sporae fusiformes, apicibus sat acutis, 1-septatae, long. 0.013—0.018, crass. 0.003—0.004 mm. Hypothallus radiceformis. — Var. **subcandida** a *Th. candido* differt apicibus squamarum vulgo verrucaeformibus, convexis incrassatisque, hypothallo radiceformi, apotheciis p. p. denudatis, hypothecio obscuriore et in var. typicam (*opuntioide*m) transit.

Obs. 2. *F. glebosa*, a Nyl. indicata, thallo minus evoluta, verrucis minoribus pruinosisque instructa est. *Lecidea glebosa* Ach., Lich. Univ. (1810) p. 187, verrucis glaucis, tenuiter pruinosis, minoribus, apotheciis minoribus, tenuiter pruinosis instructa est sec. specim. orig. ex Helvetia.

Th. candidum (Web.) Mass.

Thalloidima Mass. Ric. Lich. Crost. (1852) p. 338, f. 197; Körb. Syst. Lich. Germ. (1855) p. 179; Th. Fr. Lich. Arct. (1860) p. 173; Arn. Lich. Fränk. Jur. (1884) p. 147. *Lichen candidus* Web. Spic. Fl. Gött. II (1878) p. 193. *Lecidea candida* Ach. Meth. Lich. (1803) p. 79, Lich. Univ. (1810) p. 212, Syn. Lich. (1814) p. 50 (p. p.); Nyl. Lich. Scand. (1861) p. 215. *Toninia* Th. Fr. Lich. Spitsb. (1867) p. 33 (specim. non vidi), Lich. Scand. II (1874) p. 338 p. p.

Exs. Moug. et Nestl. VII (1820) n. 642. — Desmaz. Pl. Cr. Fr. XXIII (1841) n. 1140, ed. 2 n. 540. — Rabenh. Lich. Eur. I (1855) n. 12.

Thallus squamosus, squamis repentibus adpressisque, foliaceo-applanatis, demum lobatis crenatisve, ambitum versus sat tenuibus et subplanis, medio demum incrassatis, haud distincte clavatis, haud aut demum leviter fistulosus, hypothallo radiceformi haud distincto aut (in exs. Desmaz.) parum evoluto, aut in v. *hypomelaena* bene evoluto, superne crebre caesio-pruinosis, haud rimulosus. Apothecia late adnata, basi haud aut leviter constricta, mediocria, plana aut rarius demum depresso-convexa, caesio-pruinosa. Hypothecium superne dilute rubricosum. Sporae fusiformes, 1-septatae.

Distr. Praesertim ad detritum locis calcariis in regionibus alpinis crescit. In Fennia nondum est collectum, sed e pluribus locis in Suecia et Norvegia indicatur.

Specimen Acharianum (rite determinatum ex Helvetia) hic describimus. Thallus squamis circ. 2—7 mm latis, saepe confluentibus, lobis circ. 1.5—0.7 mm latis. Apothecia lat. 1—2.5 mm, margine modice incrassato, leviter aut haud prominente, subpersistente, pruinoso. Peritheciis extus violascentibus, intus pallidis, ex hyphis formatum radiantibus, conglutinatis, membranis modice incrassatis, cavitatibus tenuibus. Hypothecium superne dilute rubricosum et ex hyphis erectis formatum, inferne pallidum et ex hyphis irregulariter contextis, conglutinatis, modice pachydermaticis formatum. Hymenium crass. 0.060 mm, jodo caerulescens. Epitheciis violascentibus, KHO pulchrius violascentibus (sicut etiam aliae partes rubricosae violascentesve apothecii reagent). Paraphyses sat arcte cohaerentes, simplices, crass. 0.0015 mm, apice 0.003 mm. Sporae 8-nae, distichae, fusiformes, apicibus sat acutis, 1-septatae, long. 0.016, crass. 0.003 mm, sec. Hepp Flecht. Eur. (1853) tab. XV n. 124 „long. 0.013—0.0027 mm“.

Obs. 1. *Lecidea candida* Ach. sec. herb. Ach. spectat ad *Th. candidum* (Web.) ex Anglia, Hispania, Suecia, *Th. mammillare* e Gallia et Hispania et *Th. toninianum* Mass. ex Helvetia.

Obs. 2. Plantae, sub nomine *T. candidae* in Malme Lich. Suec. Exs. n. 411 et Havaas Lich. Exs. Norv. n. 286 distributae, pertinent ad *Th. subrimulosum* Nyl. (Fl. 1875 p. 445), quod proxime affine est *Th. Nordlandico* (Th. Fr. Lich. Scand. II p. 339).

Obs. 3. Var. *hypomelaena* Vain., supra ipsam rupem ad Engelberg in Helvetia a me abundanter collecta, thallo instructa est superne crebre pruinosa, inferne nigro, repente, applanato, rhizinis 3—4 mm longis, radiciformibus, constipatis, nigris, hypothecio superne 0.040 mm late roseo, parte inferiore 0.100—0.120 mm lata albida.

Th. squalescens (Nyl.) Vain.

Lecidea squalescens Nyl. Nov. Lich. Norv. (Vet. Ak. Förh. 1860) p. 297, Lich. Scand. (1861) p. 220, Enum. Lich. Fret. Behr. (1888) p. 23. *Toninia* Th. Fr. Lich. Scand. II (1874) p. 340. *Thalloidima rimulosum* Th. Fr. Lich. Arct. (1860) p. 174. „*Lecidea Dufourii* Ach.“ in herb. Nyl., Fl. 1867 p. 373 p. p. (excl. specim. Achariano).

Thallus e verrucis constans saepe demum clavatis et proliferis ramosisve aut subtuberculosis, solidis aut demum fistulosis, vertice convexis, circ. 0.5—0.2 (0.7—0.1) mm latis, saepe demum substipitatis et in hypothallum radiciformem plus minus distinctum continuatis, cinerascens, haud pruinosis. Apothecia adnata, haud constricta, convexa, immarginata, nigra, nuda. Hypothecium impure pallidum. Sporae ellipsoideae, 1-septatae.

Distr. Supra muscos et detritum rupium in regionibus alpinis Scandinaviae proveniens, etiam in Lapponiam distributum esse indicatur, sed specimina huc relata, a me denuo examinata, revera ad alias species pertinent (conf. p. 140).

Facie externa saepe vix differt a *Bilimbia ligniaria* et *B. tri septa*, sed specimen orig. distincte ad *Thalloedaema* pertinet, indole thalli hypothallique ad parvum *Th. caeruleonigricans* accedens. — Verrucae thalli confertae, crustam saepe crassam, interdum sat tenuem formantes. Apothecia dispersa aut leviter conferta, opaca. Perithecium ex hyphis formatum radiantibus, sat pachydermaticis, conglutinis, tubulis tenuibus, chondroideum, dilute sordide aeruginosum aut partim subdecoloratum. Hypothecium sordide pallidum, KHO paullo magis obscuratum, in parte superiore hyphis sat erectis, ceterum irregulariter contextis, conglutinis, chondroideum. Epithecium olivaceo- aut partim subaeruginoso-nigricans (KHO non reagens in specim. orig. n. 18840, quod hic descriptum est). Hymenium jodo caerulescens, dein subviolaceo-decoloratum (Th. Fr.). Paraphyses arcte cohaerentes, crass. 0.001 mm, apice 0.0015 mm, parum ramoso-connexae, KHO parum turgescens. Asci clavati. Sporae distichae, apicibus rotundatis, „long. 0.007—0.010, crass. 0.004—0.006 mm“ (sec. Nyl.).

Obs. 1. *L. sphaeroides* **L. sabuletorum* f. *simplicior* Nyl. [Lich. Scand. (1861) p. 205], „sporis 1-septatis (longit. ut in typo) et interdum gelatina hymenea jodo vinose rubente (supra muscos ad Helsingforsiam, Nyl., in Sueciae montibus, Thedenius, atque supra terram Lapponiae)“ descripta est. Specimen prope Helsingforsiam (Tali) lectum ad *Lecideam verruculam* (Norm.) pertinet (conf. Th. Fr. l. c. p. 523). Planta in Suecia (ad Funnedsalsberget) lecta est *Lecidea Dufourei* (Ach.) Nyl., cujus specimen orig., in Vogesiis a Blind lectum, sporis oblongis aut ovoideo-oblongis, 1-septatis, 0.010—0.016 mm longis et 0.0035—0.006 mm crassis et verruculis thalli confluentibus, nec demum substipitatis clavatisve, nec fistulosis a *Th. squalescente* differt (conf. Nyl. Fl. 1867 p. 373). Specimina supra Grimmias in Kipinä Lapponiae a G. Selin collecta, verruculis thalli minoribus, nec substipitatis nec fistulosis instructa, ad *Bilimbiam* [*B. trisepta* (Naeg.) Arn.] pertinent. „*Lecidea Dufourei*“, in Norrl. Ber. Torn. Lappm. p. 336 a Nyl. rite determinata, ad *Th. squalescens* a Th. Fr. l. c. erronee relata est. .

Obs. 2. *Catillaria sphaeralis* Koerb., Par. Lich. 3 Lief. (1861) p. 196 (sec. descr.), Arn. Lich. Tirol XIV (1875) p. 26 (458) sec. specim. orig., *Buellia* Anzi Neosymb. (1866) p. 12 (sec. specim. orig.), pertinet ad *Catillariam Dufourei* (Ach., Nyl.). In specim. Arnoldi Nylander conidia observavit bacilliformia, recta, long. 0.0045, crass. 0.001 mm, sterigmatibus simplicibus. Diversae sunt *L. sphaeralis* Fr. Vet. Ak. Handl. 1822 p. 254 et *L. arctica* β . *sphaeralis* Schaer. Enum. Lich. Eur. (1850) p. 135 (conf. Th. Fr. Lich. Scand. p. 383).

2. *Th. triste* (Th. Fr.) Vain.

Psora tabacina β . *tristis* Th. Fr. Bot. Not. 1865 p. 38. *Toninia tristis* Th. Fr. Lich. Scand. II (1874) p. 341. *Lecidea tabacina* Nyl. Ét. Lich. Alg. (1854) p. 328 (sec. Lich. Par. p. 87), haud *Psora tabacina* Ramy in D.C. Fl. Fr. II (1794) p. 367 (sec. Nyl. l. c.). *Thalloedema tabacinum* Jatta Fl. It. Crypt. Lich. p. 644; Vain. Lich. Ins. Philipp. III (1921) p. 74. *L. subtabacina* Nyl. Lich. Par. (1896) p. 87.

Thallus e verrucis constans saepe demum clavatis, simplicibus aut ramosis, irregularibus, vertice convexis, circ. 3—0.3 mm latis, solidis aut demum fistulosis, olivaceo-testaceis aut tabacino-fuscescentibus, haud pruinosis, hypothallo breviter subfruticuloso aut indistincto. Apothecia adnata, basi bene constricta, primum plana marginataque, demum convexa immarginataque, nigra, nuda. Hypothecium fuscescens rubricosumve. Sporae oblongae aut subfusiformes aut ovoideae, 1-septatae.

Distr. Supra muscos destructos (Grimmias) in latere rupis in regione subalpina montis Iivaara in Kuusamo (Vain., f. subaromatica).

Obs. 1. In f. *subtabacina* (Nyl.) Vain. sive in f. typica thallus verrucis demum irregularibus, clavatis ramosisque ad instar thalli *Th. caeruleonigricantis*, saepe etiam reniformi-sinuatis et raro hypothallo fruticuloso brevi. Apothecia primum margine modice incrassato. Conidia sec. Th. Fr. „tenuissima, acicularia, leviter curvata, long. circ. 0.015—0.019 mm“. „KHO partes obscurae fiunt magis rubricosae. Paraphyses laxae cohaerentes. Hymenium jodo leviter caerulescit, dein subvinose rubet“ (Th. Fr.).

Obs. 2. F. *subaromatica* Vain. (*Lecidea subaromatica* Vain. Adj. Lich. Lapp. II, 1883, p. 6). Verrucae thalli minus evolutae, simplices aut ramosae, parum clavato-elongatae, hypothallo indistincto. — Apothecia lat. 1—1.3 mm. Hymenium 0.040—0.060 mm crassum, totum dilute fuscescens aut epithecio paullo intensius fuscescente. Paraphyses arcte cohaerentes. Hypothecium crassum, fuscescens vel rubricosum. Sporae oblongae aut ovoideae, simplices aut 1-septatae, long. 0.011—0.018, crass. 0.0045—0.006 mm. Hymenium jodo persistenter caerulescens.

Obs. 3. *Lecidea tabacina* Nyl., Lich. Paris (1896) p. 87, sporis ellipsoideis vel ellipsoideo-oblongis, simplicibus, long. 0.010—0.018, crass. 0.005—0.006 mm, ad *Psora* pertinet, sed habitu subsimilis *Th. tristi*. „*Psora tabacina* Ram. in D.C. Fl. Fr. II (1794) p. 367 sec. herb. D.C. omnino sit *Lecidea silacea* Ach.“, ut ait Th. Fr. l. c.

3. *Th. syncomistum* (Floerk.) Vain.

Lecidea sabuletorum β . *syncomista* Floerk. Berl. Mag. 1803 p. 310; Sommerf. Suppl. Fl. Lapp. (1826) p. 155; Stizenb. Lec. Sabul. (1867) p. 38. *Bilimbia syncomista* Th. Fr. Lich. Arct. (1860) p. 185 (haud Koerb.), Lich. Spitsb. (1867) p. 35; Norm. Spec. Loc. Nat. (1868) p. 349. *Toninia* Th. Fr. Lich. Scand. II (1874) p. 335. *Lecidea* Nyl. in Norrl. Fl. Kar. Oneg. II (1876) p. 33; Vain. Adj. Lich. Lapp. II (1883) p. 5. *Lecidea lobulata* Sommerf. Phys.-oecom. Beskr. Saltd. (1826) p. 54 (sec. Th. Fr. l. c.). *Bilimbia sabulosa* Mass. Ric. Lich. Crost. (1852) p. 122 (sec. Stizenb.). *Biatora Regeliana* Hepp Flecht. Eur. II (1857) n. 280.

Exs. Hepp l. c. — Havaas Lich. Exs. Norv. (1913) n. 435.

Thallus squamulosus, squamulis 1.5—0.3 mm latis, crenulatis lacinulatisve, confertis, demum confluentibus et crustam formantibus verruculoso-inaequalem, modice in-

crassatam, glaucescentem vel flavido-pallescentem vel impure subalbidam, hypothallo indistincto. Apothecia adnata, basi haud constricta, fere mox convexa immarginataque, demum elevato-hemisphaerica subglobosave, nigra, nuda. Hypothecium fusco-rubricosum. Sporae subfusiformes vel oblongae elongataeve, 1—3-septatae.

Distr. Supra muscos destructos et terram nudam locis calcariis et talcaceo-schistosis rara. Al.: Bastö (E. Nylander, „*L. vernalis* v. *montana*“ sec. Nyl. in Herb. Mus. Fenn., 1859, p. 88 p. p.). Ab.: Söder-Jurmo in par. Korpo („*L. vernalis* v. *montana*“ Nyl. Ad Veg. Lich. Hels., 1859, p. 240). Ta.: Ad Templum in Renko (A. Kullhem). KOn.: Valkeamäki (Th. Simming, J. P. Norrlin), Tiudie (Th. Simming, A. Kullhem). Kuus.: Ad Kitkajoki (F. Silén), Sirkelä ad Paanajärvi (Vain.).

Squamae sat tenues, haud pruinosaе, planiusculae. Apothecia partim demum irregulariter conferta, opaca, (raro fusciculo-testacea: f. *diluta* Norm. l. c. p. 350). „Perithecium extus subincoloratum, intus hypothecio subconcolor. Hypothecium KHO magis violascens“ (Th. Fries). Hymenium „0.070—0.080 mm crassum“ (Stizenb.), jodo caerulescens deindeque obscure vinose rubens. Paraphyses apice decoloratae aut passim dilute fusciscentes aut „olivaceae“ (Stizenb.) aut „plus minus smaragdulae vel smaragdulo-caerulescentes“ (sec. Th. Fr.). Sporae apicibus obtusis, long. 0.013—0.024, crass. 0.004—0.006 mm, forma variabiles in eodem apothecio, „locis aridis sporis dyblastis“ (*Catillaria Theobaldi* Koerb. Parerg. Lich. p. 197 sec. Th. Fr.). Conidia „filiformia, recta aut leviter arcuata, long. 0.012—0.014, crass. non 0.001 mm“ sec. annot. Nyl. (16833) aut „curvata vel rectiuscula, long. 0.015—0.018, crass. 0.001 mm“ (Th. Fr.). Gonidia globosa, diam. 0.009—0.005 mm, aut ellipsoideo-subglobosa et long. 0.009, crass. 0.0065 mm, tantum simplicia visa, dilute flavescentia, membrana tenui, sed distincta.

Obs. 1. *Lecidea vernalis* 5. var. *montana* Nyl., Prodr. Lich. Gall. (1857) p. 354 (108), quoad specim. supra muscos in rupe ad Bigorre Pyrenaeorum lecta (16823 in herb. Nyl.) spectat ad speciem thallo instructam tenuissimo, cinerascente, gonidia continente ad Trentepohliam pertinentia, cellulis 0.010—0.014 mm latis, anguloso-subglobosis, partim concatenatis, membrana incrassata instructis, apotheciis 1.2—0.8 mm latis, basi bene constrictis, disco persistenter plano, nigro aut

rarius fuscescente, margine sat crasso, prominente, atro, hypothecio et epithecio rubricoso, hymenio jodo caerulescente, ascis sat leptodermaticis, clavatis, sporis 8:nis, distichis, oblongis aut parce ovoideis, decoloribus, 1-septatis, long. 0.013—0.017, crass. 0.0045—0.006 mm (nominetur *Catinaria montana* Vain.). Ad eam non pertinent a Nyl. item cit. Schaer. Lich. Helv. Exs. n. 194 et planta sporis simplicibus descripta (*Lecidea assimilata* sec. annot. Nyl. in bibl. sua). *C. montanae* proxime affinis est *Catinaria grossa* (Pers.) Vain. (*L. grossa* Nyl. l. c. p. 385 s. 139, *Catillaria* Th. Fr. l. c. p. 581), quae sec. specim. Personianum (5519 in herb. Nyl.) gonidiis instructa est a *Trentepohlia* praeditis, cellulis 0.009—0.011 mm crassis, partim concatenatis, membrana modice incrassata. *Catinaria* ad *Lecanactideas* pertinet, sporis 1-septatis a *Lecanactide* et *Rhexophiali* differens.

Obs. 2. *Lecidea vernalis* var. *montana* Nyl., Herb. Mus. Fenn. (1859) p. 88, spectat ad *L. sanguineoatram* var. *Templetoni* Vain. e Bastö Alandiae et ad *Bilimbiam* (*trisepta* Nyl.) ex Jurmo (E. Nylander), ad *Bilimbiam* (*trisepta*) e Vihti (W. Nyl.) et ad specimen a me haud visum e Savonia. In Nyl. Lich. Scand. (1861) p. 205 nominatur *L. sphaeroides* **L. subuletorum* 3) *montana*, et specimen ibi e Gotlandia citatum pertinet ad *Thalloedaema syncomistum* (ut etiam Nyl. adnotavit in herb. suo). *L. sabuletorum* var. *syncomista* f. *montana* Stizenb., Lec. Sab. (1867) p. 40, tab. II f. 97—100, quoad descriptionem spectat ad specimen a Nyl. missum, ad Barèges collectum (n. 19049), ad *Th. syncomistum* pertinens. *L. sabuletorum* **L. montana* Nyl. in Norrl. Ber. Torn. Lappm. (1873) p. 336 sec. specim. ad Pättikkö lectum pertinet ad *L. ramulosam* Th. Fr. (specim. ex Allipahta in mus. non reperi).

4. *Th. cumulatum* (Sommerf.) Vain.

Lecidea cumulata Sommerf. Suppl. Fl. Lapp. (1826) p. 157; Nyl. in Norrl. Ber. Torn. Lappm. (1873) p. 338; Vain. Adj. Lich. Lapp. II (1883) p. 6. *Biatorina* Th. Fr. Lich. Arct. (1860) p. 187; A. Smith Mon. Brit. Lich. (1911) p. 112. *Toninia* Th. Fr. Lich. Scand. II (1874) p. 341. *Lecidea paracarpa* Nyl. Herb. Mus. Fenn. (1859) p. 111, Lich. Scand. (1861) p. 219.

Exs. Th. Fr. Lich. Exs. Scand. II (1860) n. 44. — Zwackh Lich. Exs. (1876) n. 467. — Malme Lich. Suec. Exs. VIII (1910) n. 184.

Thallus subsquamoso-crustaceus, ambitu lacinulato-effiguratus, lacinulis 0.15—0.5 mm latis, confluentibus, modice incrassatus, adnatus, superne cinerascens aut obscure cinerascens aut subalbidus. Apothecia minuta, basi vulgo constricta, in acervulos creberrime aggregata, disco vulgo plano, nigro aut fusco-nigro, nudo, margine tenui,

fuscescente, demum excluso. Hypothecium subdecoloratum aut dilute fuscescens. Sporae fusiformes oblongaeve, septis 1 (—3).

Distr. Ad terram arenariam et detritum rupium in regione alpina, betulina (subalpina) et pinifera haud rara, praesertim in partibus occid. Lapponiae (sec. Norrl. l. c., Vain. l. c.). LKaj.: In ericeto prope Hossa in par. Kianta (Vain.). Kuus.: In reg. abietina montis Näränkävaara, in reg. subalpina montium livaara et Nuorunen (Vain.), Ruka-vaara (F. Silén). LKem.: Kittilä (E. Nylander), Olostunturi in Muonioniska (Norrl.). LEnont.: Hetta (Norrl.). LIn.: Verkkojärvi (F. Silén), Ruovveoivi (A. V. Granit et B. R. Poppus), Inari (E. Nylander, „*L. perfidiosa*“ Nyl. Lich. Scand. p. 244). LIm.: Lovosersk (A. O. Kairamo).

Thallus squamis circ. 1—5 mm latis, centro saepe demum verruculoso-inaequalis, lacinulis planis aut convexis, 0.25—0.3 mm crassis, KHO superne flavescens, dein subolivaceis, intus flavescens et KHO cum CaCl_2O_2 dilute, vix distincte subru-
bescentibus, hyphis praesertim verticalibus, strato corticali haud evoluto. Hypothallus constans e tomento albido cinerascen-
te, e squamis subtus excrescente, hyphis 0.0042—0.0025 mm crassis, membranis modice incrassatis. Apothecia saepe demum p. p. confluentia, opaca. Perithecium extus fuscescens, intus pallidum, ex hyphis apice clavatis, subradiantibus, conglutinis, formatum. Hypothecium sat dilute fuscescens, KHO (sicut etiam aliae partes apothecii) vulgo non reagens (interdum partim subrubricosum). Hymenium crass. 0.060 mm, sec. Nyl. jodo caerulescens deindeque vinose rubens. Epithecium fuscum. Paraphyses arcte cohaerentes, crass. 0.0015—0.002 mm, apice clavato-incrassatae. Sporae apicibus acutis obtusisve, 1-septatae aut sec. Nyl. et Th. Fr. etiam 3-septatae, saepe etiam simplices in eodem apothecio, „long. 0.012—0.022 mm“ (sec. Nyl.), „crass. 0.004—0.006 mm“ (sec. Th. Fr.). Gonidia cystococcoidea, globosa diam. 0.008—0.013 mm, saepe etiam subellipsoidea et long. 0.016, crass. 0.011—0.012 mm, p. p. pyrenoide instructa, membrana sat tenui.

Obs. *Lecidea perfidiosa* Nyl., Lich. Scand. (1861) p. 244, ad specimen malum *Th. cumulati* spectans, sporis simplicibus a Nyl. descripta est, sed secund. annot. poster. ejus etiam sporis 1-septatis est instructa. — *L. cumulata* f. *paracarpa* Nyl. in Norrl. Ber. Torn. Lappm. (1873) p. 342 a typo non distinguenda est.

Th. conglomeratum (Ach.) Mass.

Thalloidima conglomeratum Mass. Ric. Lich. Crost. (1852) p. 97; Koerb. Par. Lich. 2 Lief. (1860) p. 121. *Lecidea conglomerata* Ach. Lich. Univ. (1810) p. 201, Syn. Lich. (1814) p. 33; Schaer. Lich. Helv. Spic. III (1828) p. 121, IV (1833) p. 192, En. Lich. Eur. (1850) p. 102; Fr. Lich. Eur. Ref. (1831) p. 287; Tul. Mém. Lich. (1852) p. 166; Nyl. Prodr. Lich. Gall. (1857) p. 122 (368), Lich. Scand. (1861) p. 215; Th. Fr. Lich. Scand. II (1874) p. 411. *Psora* Koerb. Syst. Lich. Germ. (1855) p. 178; Arn. Lich. Tirol XIV (1875) p. 441, XV (1876) p. 358 (XIII, 1874, p. 237 p. p.). *L. pelidna* var. *conglomerata* Flot. Bot. Zeit. 1828 p. 676. *L. conglomerascens* Nyl. Fl. 1874 p. 313 (sec. Nyl. in herb. suo). *L. squalens* Nyl. l. c. (sec. specim. orig.). *Thalloidima squalens* Arn. Lich. Tirol XIII, 1874, p. 259. *Psora conglomerata* var. *squalens* Arn. l. c. XIV, 1875, p. 441.

Exs. Schaer. Lich. Helv. Exs. VII (1828) n. 169 (sec. cit.). — Flot. Lich. Exs. III n. 208 (herb. Nyl.). — Zwackh Lich. Exs. (1852) n. 120, (1884) n. 942 (in herb. meo). — Anzi Lich. Rar. Langob. III (1861) n. 114 (sec. Arn.). — Rabenh. Lich. Eur. Exs. 27 (1865) n. 738 (mus. Fenn.). — Erb. Crit. It. ser. 1, XIV n. 680 (sec. Arn.). — Arn. Lich. Exs. (1869) n. 407, (1876) n. 673 (herb. Nyl.).

Thallus squamulosus, squamulis circ. 1.5—0.5 mm latis, angulosis difformibusve, latere abundanter proliferis, demum glomerulos 2—10 mm latos, crassos, stipitados formantibus, planiusculis aut concaviusculis, pallidis aut partim cinerascentibus obscuratisve, margine subalbido aut caesio-cinerascente, subpruinoso, hypothallo radiceformi, demum elongato. Apothecia late adnata, basi anguste constricta, primum plana marginataque, demum convexa immarginataque, vulgo irregulariter conferta, nigra, nuda. Hypothecium albidum. Sporae oblongae aut ellipsoideae, 1-septatae aut majore parte simplices.

Distr. In rupibus graniticis et schistosis crescit. Ad Kongsvold alpium Dovrensiensium in Norvegia ster. a Th. Fr. collectum (herb. Vain.). Lichen, nomine „*L. conglomeratae*“ a Nyl. in Norrl. Ber. Torn. Lappm. p. 347 determinatus, in jugo alpino inter Kilpisjärvi et Lyngen collectus, est *Toninia verruculosa* (Th. Fr.) ster.

Indole thalli facile dignota. Thallus „CaCl₂O₂ non reagens, KHO leviter flavescens“, hypothallo albedo, demum fragili, quare substrato laxo affixus. Apothecia lat. 1—0.7 mm, „KHO non reagentia.“ „Hypothecium decoloratum. Epithecium obscure viride, HNO₃ roseo-violascens“ (sec. Arn. Lich. Tirol XIV p. 441). „Paraphyses mediocres. Hymenium jodo caerulescens, dein vinose rubens“ (*L. squalens* Nyl. Fl. 1874 p. 413) aut „caerulescens, demum thecis fulvescentibus“ (*L. conglomerascens* in herb. Nyl.). „Sporae apicibus rotundatis obtusisve, rectae aut leviter curvulae, long. 0.009—0.017, crass. 0.035—0.006 mm“ (Arn.

l. c., Nyl. in herb. suo). Conidia „filiformia, arcuata, long. 0.012—0.015“ (*L. conglomerascens* Nyl. in herb. suo) aut long. 0.016—0.020, crass. 0.0005 mm (*L. squalens* Nyl. in herb. suo).

3. *Bacidia* De Not.

in Giorn. Bot. Ital. (1846) p. 189; Koerb., Syst. Lich Germ. (1855) p. 185; Th. Fr., Lich. Scand. II (1874) p. 342. *Patellaria* Müll. Arg., Princ. Classif. (1862) p. 56 p. p. *Secoliga* ε. *Bacidia* Stizenb., Krit. Bem. Lecid. Nadelf. Sp. (1863) p. 10. *Lecidea* Stirps *L. luteolae* Nyl. in Hue Ad-dend. II (1886) p. 162, Lich. Exot. (1892) p. 200. *Lecidea* subg. *Bacidia* Vain. Étud. Lich. Brés. II (1890) p. 10.

Thallus crustaceus, uniformis, raro verruculis sub-coralloideo-connatis, interdum sorediosus. Sporae acicula-res aut bacillares aut fusiformi-aciculares, vulgo 3—pluri-septatae, interdum septis haud evolutis, decolores. Hyme-nium vulgo jodo reagens. Perithecium ex hyphis radianti-bus, conglutinatis formatum. Gonidia pleurococcoidea.

Subg. I. *Eubacidia* (Zahlbr.) Vain. Hymenium jodo saltem primum caerulescens. 150.

Sect. 1. Hypothecium intense obscureve coloratum.

Ser. A. Hymenium crassum (0.120—0.060 mm).

† Sporae longiores (long. 0.070—0.036 mm).

1. *B. fuscorubella* (Hoffm.) Arn. Apothecia lat. 1.5—0.5 mm, basi bene constricta, margine persistente aut demum excluso. 150.

2. *B. propinqua* Hepp. Apothecia lat. 0.7—0.4 mm, late adnata, margine mox excluso. Sporae crass. 0.003—0.005 mm. 152.

†† Sporae breviores (long. 0.040—0.025 mm).

3. *B. vegeta* Vain. Apothecia margine mox excluso. Sporae crass. 0.0025—0.003 mm. 153.

Ser. B. Hymenium tenuius (0.060—0.040 mm).

§ Epithecium typice aeruginosum (in formis incon-stantibus pallidum).

△ Sporae bacillares (cylindricae).

4. *B. affinis* (Zwackh) Vain. Corticola aut raro muscicola vel saxicola. 154.

△△ Sporae aciculares (alterum apicem versus attenuatae).

5. *B. muscorum* (Sw.) Arn. Apothecia majora (lat. 1.5—0.3 mm). Sporae subrectae aut leviter flexuosae. Muscicola et terricola. 162.

6. **B. peltigericola** Vain. Apothecia minora (lat. 0.38—0.2 mm). Sporae spiralter contortae. Peltigericola. 165.

§ § Epithecium fuscescens pallidumve aut decoloratum.

○ Apothecia atra aut nigricantia.

7. **B. inornata** (Nyl.) Th. Fr. Hymenium decoloratum. 166.

8. **B. incompta** (Borr.) Anzi. Hymenium partim rubricosum. 166.

○○ Apothecia fuscescentia aut versicoloria in eadem specie.

✕ Sporae aciculares.

✕ Hypothecium superne subrufescens aut pallido-rufescens, inferne dilutius coloratum decoloratumve.

9. **B. herbarum** (Hepp) Arn. Apothecia versicoloria. Muscicola et humicola. 168.

10. **B. Arnoldiana** Koerb. Apothecia vulgo disco cinereo-fuscescente. Saxicola. 170.

✕✕ Hypothecium totum fuscum.

11. **B. dolera** (Nyl.) Blomb. et Forss. Apothecia disco fusco. Corticola. 172.

✕✕ Sporae subbacillares.

12. **B. sparsa** Kullh. Apothecia badiofusca. Lignicola. 172.

Sect. 2. Hypothecium decoloratum pallidumve aut dilute coloratum (aut raro rubescens).

Ser. A. Hymenium crassum (0.120—0.060 mm).

† Apothecia obscurata.

§ Thallo verrucoso-inaequali verruculoso.

✕ Epithecium rubricosum fuscescens.

○ Apothecia basi bene constricta.

13. **B. subacerina** Vain. Epithecium KHO violascens. 174.

○○ Apothecia late adnata.

***B. laurocerasi** (Del.) Vain. Epithecium KHO non reagens. Sporae crass. 0.0045—0.0025 mm. 175.

15. **B. arceutina** (Ach.) Arn. Epithecium KHO violascens. Sporae crass. 0.0015 (—0.0025) mm. 179.

✕ Epithecium subcyanescens aut nigricans.

△ Apothecia late adnata.

14. ***B. atrogrisea** (Hepp) Vain. Epithecium nigricanti-fuliginum. 176.

B. endoleuca (Nyl.) Vain. Epithecium cyanescenti-nigricans, KHO non reagens. 177.

△△ Apothecia basi constricta.

B. intermissa (Nyl.) Malme. Epithecium cyanescenti-nigricans aut partim subolivaceo-caerulescens, KHO subolivaceum aut aeruginosum. 178.

†† Apothecia typice pallescentia.

16. **B. rubella** (Ehrh.) Mass. Apothecia vulgo carneopallida, raro testaceo-rufescentia aut sanguineo-rubricosa. 181.

Ser. B. Hymenium modice incrassatum aut tenue (0.065—0.035 mm crassum).

a. Sporae rectae aut leviter flexuosae.

§ Sporae aciculares (alterum apicem versus attenuatae).

† Apothecia crassiora (crass. 0.36—0.18 mm).

○ Apothecia basi bene constricta.

17. **B. inundata** (Fr.) Koerb. Apothecia vulgo persistenter plana, versicoloria, carneopallida et rufescentia et nigricantia. 185.

Lecidea inundata Nyl. Conidia long. 0.020—0.035 mm (macroconidia?). 187.

Lecidea subinundata Nyl. Conidia long. 0.012—0.018 mm (microconidia?). 187, 189.

21. **B. hemipolia** (Nyl.) Vain. Apothecia convexa, subdimidiatim obscurata et pallida. 194.

○○ Apothecia late adnata.

△ Apothecia pallida.

19. **B. albescens** (Hepp) Zwackh. Apothecia fere mox convexa, margine tenui. 191.

20. **B. intermedia** (Hepp) Arn. Apothecia persistenter plana aut demum convexa, margine paullo crassiore. 192.

△△ Apothecia obscura.

22. **B. Friesiana** (Hepp) Koerb. Hypothecium subpallidum. 196.

23. ***B. Holloensis** Vain. Hypothecium croceo-rubescens. 199.

†† Apothecia tenuia (crass. 0.060 mm).

18. **B. tenella** Kullh. Apothecia parva (lat. 0.15—0.22 mm), plana, nigricantia. 190.

§§ Sporae bacillares (subcylindricae).

✕ Epithecium KHO violascens.

24. **B. minuscula** Anzi. Apothecia nigricantia aut livido-nigricantia, nuda aut pruinosa, vulgo convexa. 200.

✕✕ Epithecium KHO haud violascens.

× Apothecia simplicia.

○ Epithecium violascens, KHO aeruginosum.

25. *B. invertens* Vain. Apothecia plana. Sporae breves. 204.

○○ Epithecium subaeruginosum cyaneoscensve, KHO non reagens.

26. *B. quercicola* (Nyl.) Vain. Sporae longiores (long. 0.017—0.036 mm), vulgo demum pluriseptatae (septis 3—8). 205.

27. *B. abbrevians* (Nyl.) Th. Fr. Sporae breves, long. 0.012—0.020 (—0.025) mm, 3-septatae. 207.

×× Apothecia vulgo tuberculoso-confluentia.

28. *B. sororians* (Nyl.) Vain. Sporae breves, subrectae, 3-septatae. 209.

β. Sporae typice vermiculari-contortae aut in variationibus subrectae bacillaresque (*Scoliciosporum* Mass.).

† Apothecia sessilia, late adnata.

29. *B. umbrina* (Ach.) Th. Fr. Thallus obscuratus cinerascensve. Epithecium aeruginosum aut fuscescens pallidumve. 210.

30. *B. Hegetschweileri* (Hepp) Vain. Thallus subalbidus. Epithecium intense rubricosum. 215.

†† Apothecia basi bene constricta, p. p. breviter stipitata.

31. *B. ophiospora* (Hellb.) Th. Fr. Apothecia vulgo atra. Epithecium aeruginosum aut subolivaceum. 218.

32. *B. Kuopioënsis* Vain. Apothecia pallida testaceave aut raro subnigricantia. Hymenium decoloratum aut raro fumoso-obscuratum. 219.

Subg. II. *Arthrorthaphis*. Hymenium jodo non reagens. 220.

a. Epithecium fuscescens.

33. *B. flavovirescens* (Dicks.) Anzi. Thallus typice citrinus, raro albidus aut evanescens, ambitu nec effiguratus nec abrupte limitatus. 221.

β. Epithecium aeruginosum aut olivaceum.

34. *B. alpina* (Schaer.) Vain. Thallus vulgo citrinus, ambitu subeffiguratus aut abrupte limitatus. 224.

35. *B. fuscuregens* Vain. Thallus haud effiguratus, albidus. 226.

Subg. I. *Eubacidia* (Zahlbr.) Vain.

Bacidia sect. IV. *Eubacidia* Zahlbr. et sect. IV. *Scoliciosporum* (Mass.) Zahlbr. Ascol. (1905) p. 135, 136.

Hymenium jodo saltem primum caerulescens.

Sect. 1. *Hypothecium obscure intenseve coloratum*.

Ser. A. *Hymenium crassum* (crass. circ. 0.120—0.060 mm).

1. *B. fuscorubella* (Hoffm.) Arn.

Fl. 1871 p. 55. *Verrucaria* Hoffm. Deutschl. Fl. II (1795) p. 175. *Secoliga* Stizenb. Krit. Bem. Lecid. Nadelf. Sp. (1863) p. 53 p. p. *Lecidea* Nyl. Fl. 1878 p. 453. *Lecidea luteola* δ . *L. fuscorubella* Ach. Meth. Lich. (1803) p. 61, Lich. Univ. (1810) p. 196, Syn. Lich. (1814) p. 41 (excl. *L. hypopta*); Nyl. Lich. Scand. (1861) p. 209. *L. luteola* β . *L. acerina* (Pers.) Ach. Meth. Lich. (1803) p. 60, Lich. Univ. (1810) p. 197. *Biatora polychroa* Th. Fr. Vet. Ak. Förh. 1855 p. 17. *Bacidia* Koerb. Par. Lich. 2 Lief. (1860) p. 131; Th. Fr. Fl. 1861 p. 413. *Bacidia effusa* β . *macrospora* (Hepp) Arn. Fl. 1858 p. 505; Rabenh. Lich. Eur. Exs. XVII (1859) n. 481. *Bacidia anomala* Koerb. l. c. (1860) p. 132 p. p., Lich. Select. Germ. (1861) p. 219. *Biatora effusa* β . *macrocarpa* Hepp Flecht. Eur. III (1860) n. 520. *Biatora rubella* v. *anceps* Hepp Syn.-regist. Flecht. Eur. p. 3.

Thallus tenuis aut modice incrassatus, verrucoso- aut partim verruculoso-inaequalis, verrucis depressis, contiguis aut dispersis, cinereo-glauescens aut cinerascens aut albidus. Apothecia majuscula aut mediocria, subfusca aut p. p. sanguineo-rubescens aut rufescentia vel testaceo-rufescentia aut fusco-nigricantia, primum plana, demum vulgo convexa, margine mediocri aut sat tenui, persistente aut demum excluso, vulgo nuda. Hypothecium superne rufescenti- aut pallido-rubricosum, KHO purpureum. Hymenium crassum. Epithecium dilute rufescens aut pallidum. Sporae vulgo aciculares, longae, sat crassae, pluri-septatae.

Var. *acerina* (Pers.) Vain. *L. luteola* β . *L. acerina* (Pers.) Ach. l. c. *Secoliga fuscorubella* v. *phaea* Stizenb. l. c. (1863) p. 57. *Bacidia* Th. Fr. Lich. Scand. (1874) p. 346.

Exs. Lojka Lich. Univ. IV (1886) n. 178. — Malme Lich. Suec. Exs. IV (1908) n. 87.

Thallus tenuis aut sat tenuis, albidus aut sordide albicans. Apothecia mediocria aut raro majuscula, umbrino-rufescentia aut cinnamomea.

Distr. Al.: Ramsholm (E. Nylander). Ad corticem fraxini rara.

Var. **polychroa** (Th. Fr.) Vain. *Biatora polychroa* Th. Fr. l. c. *Bacidia fuscorubella* *a. polychroa* Th. Fr. Lich. Scand. II (1874) p. 346. *Secoliga fuscorubella* f. *umbratilis* Stizenb. l. c. (1863) p. 57; *Bacidia* Rabenh. Lich. Eur. XXVII (1865) n. 728.

Exs. Zwackh Lich. Exs. (1854) n. 233 p. p. — Rabenh. Lich. Eur. XVII (1859) n. 481, XXVII (1865) n. 728, XXXV (1874) n. 936. — Arn. Lich. Exs. (1877) n. 712 a, b, Lich. Monac. Exs. (1888) n. 50, (1895) n. 409 a, b.

Thallus modice incrassatus, cinereo-glauescens aut cinerascens. Apothecia majuscula aut mediocria, versicoloria, rufescentia aut testaceo-rufescentia aut subfusca.

Distr. Al.: Ramsholm (E. Nylander, F. Elfving). Ad corticem fraxini rara (atypica et thallo sordide albicante v. *acerinae* similis).

Variationes hujus speciei parum constantes sunt, saepe in eodem specimine transeuntes. — Apothecia vulgo crebra, sessilia, adpressa, basi bene constricta, lat. 1.5—0.5 mm, crass. circ. 0.440—0.360 mm, margine disco subconcolore, raro pruinoso [in v. *Guthnickii* (Hepp) Stizenb. et f. *umbratili* Stizenb.]. Perithecium pallidum aut in margine apothecii vulgo intus rubricosum-pallidum rufescensve, chondroideum, ex hyphis formatum radiantibus, pachydermaticis, conglutinatis, cavitatibus cellularum maxima parte oblongis, 0.002—0.005 mm latis, in parte exteriori ellipsoideis et 0.002—0.006 mm latis. Hypothecium superne rufescenti-vel subfuscescenti- aut pallido-rubricosum, inferne pallidum aut decoloratum, chondroideum, pachydermaticum, cavitatibus cellularum angustis, hyphis irregulariter contextis. Hymenium 0.120—0.070 mm crassum, totum pallidum decoloratumve aut epithecio dilute rufescente, jodo intense caerulescens. Partes intensius coloratae apothecii KHO purpurascens vel subviolascens. Paraphyses sat laxae cohaerentes, crass. 0.0015 mm, apice haud incrassatae, increbre septatae. Sporae 8-nae, polystichae, aciculares, basin versus attenuatae, apice superiore vulgo obtuso, rectae aut rectiusculae, septis transversis circ. 3—14, long. circ. 0.070—0.060 (—0.035), crass. 0.004—0.003 (—0.025) mm. „Stylosporae luteolae, long. 0.009, crass. 0.003 mm“ (Arn. Lich. Exs. n. 712 b). Gonidia pleurococcoidea, globosa, diam. 0.014—0.007 mm, vulgo simplicia, parce bicellulosa aut glomerulosa observata, membrana saepe leviter incrassata. Hypothallus indistinctus.

Obs. *Verrucaria fuscorubella* Hoffm. secundum specimen authenticum e Germania in herb. Ach. ad v. *polychroam* (Th. Fr.) pertinet, thallo olivaceo-cinereo, modice incrassato, apotheciis versicoloribus, hymenio 0.080—0.070 mm crasso, pallido, partibus lateralibus KHO leviter violascente, hypothecio parte superiore sordide rubricosum-pallido, KHO violascente (in apothecio sanguineo-rubescens hypothecium dilute

rubricosus-pallidus, KHO dilute violascentis), sporis acicularibus, long. 0.070—0.035 mm. — *Lichen acerinus* Pers. e Germania in herb. Ach. ad v. *phaeam* (Stizenb.) pertinet, thallo instructa tenui, leviter verrucosus, albus, apotheciis partim majusculis, rufis aut fusciscentibus, adpressis, 0.360 mm crassis, margine mediocri, disco planiusculo, hypothecio superne rufescente, inferne pallidius pallidius, KHO violascente, hymenio 0.120—0.110 mm crasso, epithecio dilute rufescente et pallido et decolorato in eodem apothecio, KHO dilute violascente, perithecio pallido aut partim intus rufescenti-pallido, KHO violascente (conf. Nyl. Bot. Zeit. 1861 p. 338, Stizenb. l. c., 1863, p. 61).

2. B. propinqua Hepp

in Stizenb. Krit. Bem. Lec. Nadelf. Sp. (1863) p. 58; Arn. Fl. 1866 p. 531, 1871 p. 55, Lich. Exs. (1871) n. 463, (1894) n. 1627, Lich. Fränk. Jur. (1884) p. 183; Th. Fr. Lich. Scand. II (1874) p. 353; Jatta, Fl. It. Cr. Lich. (1911) p. 582. *Lecidea* Nyl. in Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 184; Zwackh Lich. Exs. (1883) n. 846. *Secoliga fuscorubella* var. β . *propinqua* Stizenb. Krit. Bem. Lec. Nadelf. Sp. (1863) p. 58. *Biatora atrogrisea* β . *anomala* Hepp Flecht. Eur. IX (1860) n. 519.

Exs. Hepp l. c. — Arn. l. c. — Norrl. et Nyl. l. c. — Zwackh l. c. — Lojka, Lich. Univ. (1885) n. 33.

Thallus tenuis aut sat tenuis, leviter verrucosus- aut verruculosus-inaequalis, albidus aut glaucescens vel cinerascens. Apothecia mediocria aut sat parva, fusconigra aut cinereo-rufescentia aut nigricantia, semiglobosa, adpressa, late adnata, margine mox excluso. Hypothecium superne violascenti-rubricosum, KHO pulchrius violascentis. Hymenium crassum. Epithecium varie coloratum, partim decoloratum, partim sordide subolivaceum aeruginosumve aut olivaceo-nigricans aut subviolascentis, KHO dilutius coloratum. Sporae vulgo aciculares, sat crassae.

Distr. Ad corticem Populi. Ta.: Ad Letku in Tammela (A. Kullhem), in Evo (J. P. Norrlin).

Hypothallus indistinctus. Apothecia sparsa aut interdum sat crebra, lat. 0.7—0.4 mm, basi leviter constricta, crass. 0.320—0.240 mm, haud pruinosa, opaca, margine tenui. Perithecium tenue, sordide violascentis aut extus et inferne dilutius coloratum aut decoloratum, partibus coloratis KHO pulchrius violascentibus, chondroideum, ex hyphis formatum radiantibus,

pachydermaticis, cavitatibus angustis, 0.0015—0.001 mm latis, oblongis. Hypothecium superne subplecten-parenchymaticum, cavitatibus globosis, diam. 0.003—0.004 (—0.0015) mm, in seriebus subverticalibus, membranis modice incrassatis, inferne pallidum aut decoloratum et irregulariter chondroideum et ex hyphis ramoso-connexis formatum tubulisque tenuibus. Hymenium 0.105—0.070 (in specim. Heppii 0.080—0.070) mm crassum, jodo caerulescens deindeque vinose rubens. Epithecium in specim. Heppii sordide violaceum, in specim. n. 17134 in herb. Nyl., in Evo lecto, p. p. aeruginosum, in Herb. Lich. Fenn. n. 184 partim sordide cyanescens. Paraphyses simplices, arcte cohaerentes, crass. 0.001 mm, apice clavatae et 0.003—0.005 mm crassae. Sporae rectae aut leviter curvatae, aciculares aut fusiformi-aciculares aut fusiformes, apicibus obtusis aut apice inferiore vulgo attenuato, septis 6—8 (—11 ex Hepp aut 3—15, observante Th. Fr.), long. „0.058—0.036“ (ex Hepp) aut „—0.064“ mm (Th. Fr.), crass. 0.003—0.005 mm. Gonidia globosa, diam. —0.014 mm.

3. *B. vegeta* Vain. (n. sp.).

Thallus crassus aut modice incrassatus, e verruculis granuliformibus, varie confertis constans, subglaucescenti-cinerascens. Apothecia mediocria aut sat parva, cinereo-rufescentia aut cinereo-testacea, semiglobosa, adpressa, late adnata, margine mox excluso. Hypothecium superne rufescens aut subpurpureum, KHO non reagens aut distinctius purpureum. Hymenium crassum. Epithecium pallidum aut partim rufescens et vulgo maculis aeruginosis, KHO non reagens. Sporae vulgo subbacillares, longitudine et crassitudine mediocres aut sat crassae.

Distr. Ad corticem Rhamni ad basim trunci loco umbroso in Mustiala in Ta. (A. Kullhem).

B. inundatam et *B. affinem* var. *subrufescentem* in memoriam revocans, sed apotheciis semiglobosis immarginatisque et notis internis ab iis differens et magis affinis *L. propinquae*, a qua thallo omnino dissimili recedit. — Thallus verruculis granuliformibus, irregulariter aut subsidioideo-connatis, confertis et dispersis aut crustam areolato-diffractam, latam formans, opacus, hypothallo indistincto. Apothecia numerosa, sparsa aut sat crebra, lat. 1—0.4 (1.2—0.3) mm, crass. circ. 0.250 mm, basi leviter constricta, haud pruinosa, opaca. Perithecium tenue, pallidum et in margine partim

intus rubricosus-rufescens, KHO non reagens, chondroideum et in margine extus subplectenparenchymaticum et cavitatibus ellipsoideis, 0.0015 mm latis. Hypothecium superne subplectenparenchymaticum, cavitatibus rotundatis aut subellipsoideis, 0.002—0.0015 mm latis in seriebus verticalibus, membranis modice incrassatis, raro dilute coloratum, inferne pallidum et irregulariter chondroideum. Hymenium 0.070—0.090 mm crassum, jodo persistenter caerulescens (in solutione dilutiore) aut demum violascens, ascis apice persistenter caerulescentibus (in sol. concentr.). Paraphyses arcte cohaerentes, crass. 0.001 mm, apice haud aut parum incrassatae. Sporae vulgo bacillares, apicibus obtusis, rectae aut subrectae, septis 7—3, long. 0.025—0.040, crass. 0.0025—0.003 mm. Gonidia pleurococcoidea, globosa, diam. 0.008—0.020 mm, simplicia aut parce glomerulosa, membrana saepe incrassata.

Ser. B. *Hymenium modice incrassatum aut sat tenue* (crass. circ. 0.060—0.040 mm).

4. B. affinis (Zwackh) Vain.

Biatora affinis Zwackh Lich. Exs. (1859) n. 336 B [haud *L. affinis* Schaer., quae ad *L. sanguinariam* (L.) pertinet]. *L. atosanguinea* Stizenb. Krit. Bem. Lec. Nadelf. Sp. (1863) p. p. (nec Hoffm., nec Schaer., nec Anzi). *Bacidia atosanguinea* α. *corticola* Th. Fr. Lich. Scand. II (1874) p. 354 p. p. (excl. f. *curtula*). *Bacidia atosanguinea* Arn. Lich. Fränk. Jur. (1884) p. 188. *Lecidea subincompta* Nyl. Fl. 1865 p. 147; Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 187. *Lecidea umbrina* **L. bacillifera* F. 1) *incompta* Nyl. Lich. Scand. (1861) p. 210 (haud Borr.).

Thallus tenuis aut sat crassus, verruculosus aut verrucosus aut raro subisidiosus, cinereo-glauescens aut pallidus aut obscuratus, raro evanescens. Apothecia mediocria aut sat parva, basi leviter constricta, adpressa, atra aut rarissime rufescentia, disco plano aut vulgo demum convexo, margine tenui, persistente aut vulgo demum excluso. Hypothecium totum aut superne purpureum fuscescensve. Hymenium sat tenue, superne aeruginosum aut rarissime pallidum decoloratumve, KHO non reagens. Sporae bacillares aut rarius partim subaciculares, sat longae mediocresve aut raro breviores, septis vulgo numerosis, rarius paucis.

Distr. Praesertim basim versus ad truncos arborum, velut Populi, Salicis capreae, Juniperi, rarius Sorbi, Betulae,

Quercus, *Alni*, *Tiliae*, *Ulmi*, raro in rupibus calcariis schistosive et ad terram et supra muscos rupium, frequenter vel sat frequenter in provinciis meridionalibus mediisque obvenit, septentrionem versus rarens, et in Lapponia pluribus locis lecta.

Var. *endoporphysa* Vain. *Lecidea bacillifera* v. *subincompta* Nyl. in Fellm. Lich. Arct. (1865) n. 175 p. p., Nyl. Lich. Lapp. Or. (1866) p. 155. *L. atrosanguinea* f. *subincompta* Vain. Adj. Lich. Lapp. II (1883) p. 17 p. p.

Exs. Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 187. — Malme Lich. Suec. Exs. XIII (1913) n. 316 (in mus. Fenn.). — Fellm. Lich. Arct. (1865) n. 175 p. p.

Thallus tenuis aut sat tenuis, verruculosus aut verrucosus, cinereo- aut pallido-glauescens, aut raro evanescens. Apothecia disco atro. Hypothecium totum subviolaceum. Hymenium superius aeruginosum. Perithecium violascens aut extus subtusve subdecoloratum. Sporae sat longae mediocresve, septis numerosis. Corticula.

Distr. Ad truncos arborum in provinciis meridionalibus, septentrionem versus rarens. Tb.: Laurinniemi in par. Jyväskylä (Vain.). Kb.: Koriseva (Vain.). OKaj.: Kiannanniemi et alibi passim in par. Kianta (Vain.). Ob.: Pörhölä in par. Kemi (M. Brenner), Alkkula in Ylitornio (J. P. Norrlin). KKER.: Ruankoski (Fellm., Lich. Arct. n. 175 in mus. Fenn.), Iiava (Fellm.). Lln.: Kaamas (F. Silén).

Hypothallus indistinctus. Gonidia pleurococcoidea, vulgo simplicia. Apothecia sparsa aut sat crebra, lat. 0.9—0.4 mm, late adnata, basi leviter constricta, haud pruinosa. Perithecium intus aut in margine totum sordide violaceum vel subpurpureum, aut extus et subtus pallidum vel subdecoloratum, chondroideum, hyphis radiantibus, membranis pachydermaticis, conglutinis, cavitatibus angustis, vulgo oblongis. Hypothecium superne subviolaceum purpureumve aut rarius rubricosum-fuscum, subchondroideo-plectenparenchymaticum, cavitatibus cellularum depressis, membranis modice incrassatis, inferne vulgo tantum anguste dilutius coloratum chondroideumque. Hymenium 0.055—0.050 mm crassum, jodo caeruleum, dein vinose rubens. Hymenium superius aeruginosum aut aeruginoso-nigricans, interdum epithecio nigricanti-granuloso. Sporae bacillares apicibusque obtusis aut partim subaciculares alterumque apicem versus sensim attenuatae, aut sat obtusae, rectae aut sat rectae, septis vulgo 5—7, long. 0.038—0.024, crass. 0.035—0.025 mm.

Obs. 1. *Verrucaria punctata* v. *atrosanguinea* Hoffm. (Deutschl. Fl. II, 1796, p. 192), saxicola et scutellis planis, atosanguineis descripta, verisimiliter ad *L. goniophilam* Floerk. spectat. *Lecidea anomala* ð. *atrosanguinea* Schaer. (Lich. Helv. Exs., 1833, n. 212, Lich. Helv. Spic., 1833, p. 170), ad *Populum nigram* prope Laupersvillam lecta, secundum specim. orig. n. 17360 in hb. Nyl. ad *L. incomptam* Borr. pertinet, hypothecio instructa toto intense rubricoso, perithecio intus rubricoso, hymenio pallido aut partim dilute rubricoso. *Bacidia atosanguinea* Zwackh Lich. Exs. (1851) n. 85 C ad *L. endoleucam* var. *intermissam* (Nyl.) pertinet, hymenio superne dilute rubricoso et partim pallido, epithecio aeruginoso-nigricante aut partim intense aeruginoso instructa. *B. atosanguinea* Anzi, Lich. Langob. (1861) n. 146, proxima est *L. quercicolae* (Nyl.), perithecio toto purpureo et hypothecio inferne roseo ab ea leviter recedens.

Obs. 2. *Lecidea Hegetschweileri* Hepp, Syst. Samml. (1852) n. 212, *Biatora atosanguinea* J. Hegetschweileri Hepp, Flecht. Eur. (1853) n. 23 (*Secoliga atosanguinea* f. *Hegetschweileri* Stizenb. l. c. p. 17), est *L. vermifera* Nyl., apotheciis 0.130 mm crassis, hymenio superiore intense purpureo, hypothecio toto albido, perithecio toto intense purpureo, sporis contortis instructa, ad montem Uetli prope Tigurum ab Hepp collecta. *L. subincompta* f. *Hegetschweileri* in Vain. Adj. Lich. Lapp. II p. 17, ad Mäntyjoki in Kuusamo lecta, est forma *Bacidiae affinis* apotheciis parvis, hypothecio superne fusconigricante, epithecio aeruginoso, sporis bacillaribus, saepe 7-septatis, long. 0.012 - 0.028, crass. 0.002—0.0035 mm.

Var. **melanotica** (Nyl.) Vain. *Lecidea bacillifera* f. *melanotica* Nyl. Fl. 1867 p. 373. *Bacidia atosanguinea* f. *melanotica* Malme Lich. Suec. Exs. VII (1910) n. 166. *L. bacillifera* f. *subincompta* Nyl. in Fellm. Lich. Arct. (1864) n. 175 p. p. (n. 17444 in herb. Nyl.).

Thallus tenuis aut sat tenuis, verruculosus aut verrucosus, cinereo- aut pallido-glauescens aut raro albidus (saepè algis nigricantibus obductus), aut raro evanescens. Apothecia disco atro. Hypothecium totum violaceum. Hymenium superius aeruginosum. Perithecium saltem in margine extus aeruginosum, KHO violascens. Sporae sat longae mediocresve, septis numerosis. Corticola.

Distr. Ad corticem Populi, rarius Juniperi et Sorbi. Ta.: Evo (Norrl.), Mustiala (A. Kullhem). KOL.: Petrosavodsk (Th. Simming). OKaj.: Ohtosenvaara et Lehtovaara in par. Kianta (Vain.). Ob.: Turtola (Norrl.). Kker.: Soukelo (P. A. Karsten), Ruankoski (N. I. Fellman). LPon.: Ponoï (Fellm.).

Apothecia crass. 0.320—0.160 mm. Perithecium in margine extus aut totum aeruginosum et intus vulgo violascens, inferne decoloratum aut dilutius violascens. Hypothecium totum intense violascens aut in-

ferne vel medio dilutius coloratum, aut in specimine orig. varians partim fuscescens. Hymenium 0.050—0.060 mm crassum. Hymenium superius aeruginosum, simul interdum epithecio subgranuloso fuligineo obductum. Sporae bacillares aut partim subaciculares, septis vulgo 7, raro in eodem apothecio 3, long. 0.038—0.023 (observante Nyl. —0.048) mm, crass. 0.003—0.002 mm. — Etiam in specimine orig. v. *melanoticae* Nyl. (n. 355 in mus. Fenn.) perithecium in margine saltem extus aeruginosum et KHO violascens; ibi etiam thallus algis nigricantibus obductus.

Var. *erythrochlora* Vain.

Thallus tenuis aut sat tenuis, verruculosus aut verrucosus, cinereo- aut pallido-glauescens, aut raro evanescens. Apothecia disco atro. Hypothecium totum subviolaceum. Hymenium superius aeruginosum. Perithecium saltem in margine extus aeruginosum, KHO non reagens. Sporae sat longae mediocresce, septis numerosis. Corticola.

Distr. Ad corticem Salicis capreae et Populi. Ta.: Mustiala (A. Kullhem). Sat.: Sakkola in Ikalinen (V. Räsänen). Kuus.: Iivaara (F. Silén). Kker.: Soukelo (P. A. Karsten). LPon.: Ponoï („L. bacillifera f. incompta“ Nyl. Lich. Lapp. Or. p. 155, Fellm. Lich. Arct. 176 in mus. Fenn., in herb. Nyl. n. 17458, est status in v. subrufescentem transiens).

Thallus sat tenuis, verrucosus, sordide albidus aut cinereo-glauescens, aut evanescens. Apothecia lat. 0.4—0.3 mm, crass. 0.2 mm. Perithecium in margine extus aut totum aeruginosum, KHO non violascens, at saepe dilutius vix distincte aeruginosum evadit, intus saepe est violaceum et inferne decoloratum. Hypothecium totum subviolaceum aut inferne dilutius coloratum. Sporae bacillares aut partim subaciculares, long. 0.027—0.030 (observante Kullh. „—0.045“), crass. 0.002—0.003 mm, saepe 7-septatae. Hymenium 0.050—0.060 mm crassum. — In Malme Lich. Suec. Exs. XIII (1913) n. 315 hypothecio in var. *chlorocheilam* Vain. transit. Conidangia, lat. 0.110 mm, atra, conceptaculo (in lamina tenui) sordide violaceo-fuscescens, in vertice anguste subaeruginoso. Sterigmata simplicia, long. 0.020, crass. 0.005 mm, apicibus conidia efferentibus. Conidia filiformia, bene arcuata, long. circ. 0.020—0.014 mm.

Var. *epihypna* (Nyl.) Vain. *Lecidea bacillifera* **subincompta* f. *epihypna* Nyl. in Norrl. Fl. Kar. Oneg. II (1876) p. 31. *Bacidia abbrevians* f. *epihypna* Blomb. et Forss. Enum. Plant. Scand. (Points-fört.) 1880 p. 81.

Thallus modice incrassatus, verrucoso- et verruculoso-inaequalis, pallidus aut cinereo-glauescens. Apothecia disco atro. Hypothecium superius rubricosum-fuscescens, inferius dilute coloratum. Hymenium

superius aeruginosum. Perithecium in margine extus aeruginosum, KHO non reagens. Sporae sat breves, septis 3. Muscicola.

Distr. Muscos obducens supra saxa calcaria. KOn.: Mundjärvi (Norrl.).

Proxima est v. *brachyterae* (Th. Fr.). Apothecia lat. 0.8—0.3 mm, plana aut parce demum convexa, marginata aut rarius margine demum excluso. Perithecium in margine extus sordide aeruginosum, intus rubricoso-fuscescens, inferne pallidum aut aeruginosum aut sordidum. Hypothecium superius rubricoso-fuscescens, inferius dilute fuscescens aut fuscescenti-pallidum. Hymenium superius intense aeruginosum. Sporae bacillares, apicibus rotundatis, long. 0.022—0.017, crass. 0.003—0.002 mm. *L. atosanguinea* v. *epihypna* in Vain. Adj. Lich. Lapp. II (1883) p. 18, supra muscos et ad terram arenosam loco umbroso ad Mäntyjoki in Kuusamo lecta, est v. *brachytera* in v. *separabilem* Nyl. accedens, perithecio extus subdecolorato, nec aeruginoso, a v. *epihypna* differens.

Var. *separabilis* (Nyl.) Vain. *Lecidea separabilis* Nyl. Fl. 1865 p. 147. *Lecidea atosanguinea* var. *separabilis* Vain. Adj. Lich. Lapp. II (1883) p. 18.

Exs. Malme Lich. Suec. Exs. IV (1908) n. 88, V (1909) n. 112.

Thallus pallidus, verruculis minutis, granuliformibus, p. p. demum isidioideis aut fere squamulaeformibus. Apothecia disco atro aut parce etiam sanguineoatro. Hypothecium superne sordide violascens, inferne partim decoloratum. Hymenium superius aeruginosum aut partim in eodem apothecio decoloratum. Perithecium subpallidum aut in margine sordide violascens. Sporae sat longae aut mediocres, septis numerosis. Corticola.

Distr. Ad corticem Salicis capreae, Sorbi, Juniperi, Populi, Alni, Ulmi in provinciis meridionalibus, septentrionem versus rarescens. Th.: Ad Tourujoki prope Jyväskylä (Vain.). Kb.: Nuottivaara in Nurmes (Vain.). Kuus.: Iivaara (Vain.). Ob.: Ii (F. Silén), Alkkula (Norrl.). LKem.: Keimioniemi in Muonio (Norrl.). LPon.: Ponoï (Fellm. Lich. Aret. n. 176 p. p., n. 17398 b in herb. Nyl.). LIn.: Koppelo (Vain.), Kõngäs (Vain.).

In specimine orig. n. 17424 in herb. Nyl. thallus pallidus, verruculis minutis, crebris, granuliformibus, p. p. demum isidioideis, hypothecium sordide violascens (KHO non reagens), medio albidum. Hymenium superius aeruginosum, KHO non reagens. Perithecium chondroideum, intus sordide violascens, extus subalbidum. Paraphyses apice crass. 0.0015 mm, ceterum 0.001 (—0.0015) mm. Sporae „long. 0.032—0.025, crass. 0.004—0.003 mm, 3—7-septatae“, bacillares. — In specimenibus supra indicatis hypothecium est inferne plus minus late decoloratum pallidumve et perithecium saepe in margine sordide violascens.

Obs. *Biatora affinis* Zwackh Lich. Exs. (1859) n. 336 B (*Secoliga atrosanguinea* var. β . *affinis* Stizenb. Krit. Bem. Lec. Nadelf. Sp., 1863, p. 18 p. p., *Bacidia atrosanguinea* α . *corticola* f. β *affinis* Th. Fr. Lich. Scand. II, 1874, p. 356, *Lecidea bacillifera* var. *affinis* Zwackh Lich. Heidelb., 1883, p. 51), hymenio superiore sat dilute aeruginoso, hypothecio superne fuscescente, nec rubricoso, inferne late decolorato, perithecio decolorato pallidove, cavitatibus cellularum parvis in superficie perithecii ellipsoideis et 0.002—0.003 mm latis, leviter differt a v. *separabili*. *L. atrosanguinea* f. *affinis* Vain. Adj. Lich. Lapp. II p. 17 ad specimen v. *separabilis* in v. *subrufescentem* transiens spectat. F. *Zwackhiana* (n. 336 B) omnino typica in Fennia a nobis non est visa.

Var. *subrufescens* (Nyl.) Vain. *Lecidea separabilis* var. *subrufescens* Nyl. in Norrl. Bidr. Sydöstr. Tav. Fl. (1870) p. 189 (sine descr.). *L. bacillifera* **L. subincompta* f. *curtula* (Th. Fr.) Vain. Lich. Vib. (1878) p. 64.

Thallus pallidus, verruculis minutis, granuliformibus, p. p. demum isidioides. Apothecia disco rufescente aut fusco-rufescente. Hypothecium superne dilute sordide violascens aut rufescenti-violascens, inferne decoloratum. Hymenium totum decoloratum pallescensve. Perithecium dilutissime sordide violascens et partim decoloratum. Sporae sat longae aut mediocres, vulgo pluri-septatae. Corticola.

Distr. N.: Ad corticem Alni in Kyrkslätt (A. Kullhem). Ta.: Ad corticem abietis in Hollola (Norrl.). Kb.: Ad corticem Sorbi prope Nuottivaara in Nurmcs (Vain.). In eodem specimine in v. *separabilem* transiens locis sequentibus collecta: Ad corticem Abietis prope Guntäckt Helsingforsiae (Norrl.). Ka.: Ad corticem Quercus in Luurinsaari in Kakki (C. E. Boldt), ad corticem Salicis capreae, Sorbi et Ulmi prope Viburgum (Vain.). KOI.: Ad corticem Juniperi in Humbaritsa (F. Elfving). Kuus.: Ad corticem Sorbi in regione abietina montis Iivaara (Vain.). LIn.: Ad corticem Alni in regione betulina prope Kängäs (Vain.).

Colore disci a *L. affini* (Zwackh) differt, at variatio ejus est parum constans. Hymenium 0.050—0.060 mm crassum, jodo caerulescens deindeque vinose rubens, epithecio in pluribus apotheciis partim dilute aeruginoso aut subolivaceo. Hypothecium KHO parum reagens. Sporae subbacillares, „3—5-septatae“ (ex Nyl.), in meis speciminibus etiam 7-septatae, long. „0.027—0.034, crass. 0.003“ mm, long. etiam 0.021—0.038, crass. 0.002—0.004 mm. Apothecia margine nigricante aut disco concolore, disco plano aut convexo. In specimine orig. apothecia crass. 0.2 mm.

Var. *chlorocheila* Vain.

Thallus pallidus, verruculosus aut subgranulosus. Apothecia

disco nigro. Hypothecium superne dilute aut partim intense sordide fuscescens aut subrubricoso-fuscescens aut partim sordide pallidum, inferne decoloratum. Hymenium superius aeruginosum. Perithecium in margine aeruginosum, KHO non reagens. Sporae sat longae aut mediocres, vulgo pluri-septatae. Corticola.

Distr. Ad corticem Juniperi, Populi, Salicis, Quercus et in trunco Betulae. Ab.: Hannula in Askainen (K. Linkola). N.: Smeds in Kyrkslätt (M. Brenner). Ka.: Luurinsaari in Kakki (C. E. Boldt). OKaj.: Hossa in Kianta (Vain.). LIn.: Ruoptuivaara (Vain.).

Hymenium crass. 0.055—0.050 mm. Hymenium superius aeruginosum aut aeruginoso-fuligineum, nec KHO, nec HNO₃ reagens. Perithecium in margine aeruginoso-fuligineum aut dilute aeruginosum aut extus decoloratum, inferne decoloratum aut intus aeruginosum. Sporae bacillares, 3—7-septatae, long. 0.020—0.037, crass. 0.0015—0.0035 mm.

Var. chlorocheiloides Vain.

Thallus verrucoso-inaequalis aut verruculosus, sordide albicans aut cinereo-glauescens, sat tenuis aut evanescens. Apothecia sat parva aut mediocria, basi constricta, adpressa, disco atro, vulgo plano, margine tenui, atro, persistente. Hypothecium parte superiore subviolaceum fuscescensve. Hymenium sat tenue, superne aeruginosum et KHO non reagens. Perithecium in margine subaeruginosum, KHO sordide violascens. Sporae vulgo bacillares, vulgo longitudine mediocres, septis paucis aut numerosis.

Distr. Ad corticem Juniperi ad Vaania in Hollola et ad corticem Sorbi prope Pohjola in Korpilahti in Ta. (Vain.).

A *L. affini* (Zwackh) var. *chlorocheila* reactione perithecii differt. — Hypothallus indistinctus. Apothecia crebra aut sat crebra, lat. 0.3—1 mm, crass. 0.2—0.21 mm, nuda, disco opaco, plano aut raro convexo, margine tenui, atro, saepe leviter nitido, discum vulgo haud superante. Hypothecium superius violaceo-rubescens aut (in specimine e Pohjola) dilute fuscescens, KHO non reagens, subplectenparenchymaticum, cellulis in seriebus horizontalibus, cavitatibus ellipsoideis aut subglobosis, 0.0015—0.002 (—0.004) mm latis, membranis modice incrassatis, ceterum hypothecium chondroideum, irregulariter contextum, decoloratum. Perithecium ex hyphis radiantibus, conglutinatis, pachydermatis formatum, cavitatibus cellularum 0.0015—0.002 (—0.004) mm latis, rotundatis aut ellipsoideis oblongisve, in parte exteriori brevioribus, in margine totum aut intus aeruginosum aut aeruginoso-nigricans, ceterum decoloratum aut inferne intus sordide violascens. Hymenium 0.055—0.060 mm crassum, jodo caerulescens deindeque vinose rubens. Paraphyses simplices, crass. 0.001—0.0015 mm, apice capitato-clavatae et 0.003—0.004 mm crassae aut (in specim. e Pohjola) tantum 0.0015 mm

crassae. Sporae bacillares aut rarius altero apice leviter attenuato, rectae aut leviter curvatae, 3-septatae aut (in specimine e Pohjola) 6-septatae, long. 0.020—0.032, crass. 0.0015—0.003 mm. — In specimine prope Pohjola lecto, „*L. bacillifera*“ a Nyl. determinato (Vain. Fl. Tav. Orient. p. 114), apothecia vulgo sunt acervulato-prolifera.

Var. *brachytera* (Th. Fr.) Vain. Adj. Lich. Lapp. II (1883) p. 18. *Bacidia atosanguinea* a. *corticola* f. *brachytera* Th. Fr. Lich. Scand. II (1874) p. 356.

Thallus tenuis, obscure vel fuscocinereo-glauescens, verruculosus, aut evanescens. Apothecia disco nigro. Hypothecium rubricosofuscens. Hymenium superius aeruginosum. Perithecium obscure subviolascens. Sporae breviores.

Distr. In rupe talcaceo-schistosa. Kuus.: Sirkelä (Vain.).

Thallus dispersus vel evanescens. Apothecia primum plana, tenuissime marginata, dein convexa immarginataque, simplicia aut tuberculata, 0.6—1 mm lata. Hymenium circ. 0.060—0.070 mm crassum. Hypothecium totum coloratum. Perithecium obscure violascens. Sporae bacillares oblongaeve, raro fusiformes, apicibus obtusis, septis transversis 3 aut raro 4—5, long. 0.012—0.023, rarius — 0.029, crass. 0.003 (—0.005) mm. — Thallo minute verruculoso et sporis interdum pluriseptatis a *Toninia aromatica* (Turn.) differt, at notis internis ceterum ei similis est.

Var. *incrustedata* Vain. *L. atosanguinea* v. *brachytera* f. *incrustedata* Vain. l. c. p. 19.

Thallus sat crassus, verruculosus. Apothecia disco nigro. Hypothecium rubricosofuscens. Hymenium superius aeruginosum. Perithecium partim subfuscens. Sporae breviores.

Distr. In rupibus calcariis et chloritico-schistosis. KOn.: Mundjärvi et Valkeamäki et Schungu (J. P. Norrlin). OKaj.: Saarenmylly in Kianta (Vain.). Kuus.: Sirkelä (Vain.).

Thallus verruculoso-rugosus, diffractus, cinereo- aut olivaceofuscens aut sordide albido-glauescens. Apothecia demum convexa immarginataque, 0.8—1 mm lata. Hymenium 0.060—0.050 mm crassum. Hypothecium superius rubricosofuscens, inferius dilutius coloratum. Paraphyses sat arcte cohaerentes, apice clavatae, clava 0.002—0.003 mm crassa. Perithecium subfuscens et inferne dilutius coloratum aut in margine partim sordide aeruginosum vel subnigricans, KHO non reagens, subchondroideum, hyphis radiantibus, cavitatibus oblongis, 0.0015 mm latis, membranis leviter incrassatis. Sporae bacillares aut rarius altero apice attenuato, septis 3 aut raro 4, long. 0.013—0.022, raro — 0.026, crass. 0.002—0.003 mm. — Proxima est var. *oribatae* (Nyl.) Vain. (*L. oribata* Nyl. Fl. 1874 p. 16), quae sporis majoribus, „long. 0.023—0.040, crass. 0.003—0.004 mm, 3—5-septatis“ ab hac varietate secundum specim.

orig. in Scotia a Stirton lectum leviter differt. — *L. austerula* Nyl. (Fl. 1873 p. 20) difficillime a v. *incrustedata* distinguitur. Thallo morbosus, areolato, obscure cinerascens aut partim evanescente, at parce etiam squamoso, instructa, revera in *Toniniam aromaticam* (Turn.) transit.

5. *B. muscorum* (Sw.) Arn.

Fl. 1871 p. 52, Lich. Fränk. Jur. (Fl. 1884) p. 187. *Lichen muscorum* Sw. Meth. Musc. (1781) p. 36 (Th. Fr. l. c. p. 354, 356). *Lecidea* Ach. Meth. Lich. (1803) p. 33; Nyl. Lich. Par. (1896) p. 84. *L. umbrina* **L. bacillifera* f. 2) *muscorum* Nyl. Lich. Scand. (1861) p. 210. *L. bacillifera* var. *muscorum* Nyl. Lich. Lapp. Or. (1866) p. 155. *L. atrosanguinea* var. *muscorum* Vain. Adj. Lich. Lapp. II (1883) p. 20, Lich. Pitlek. (1909) p. 103. *L. pezizoidea* Hepp Würzb. Lich.-Fl. (1824) p. 60, Syst. Samml. (1852) n. 207, Flecht. Eur. (1853) n. 25 (conf. Nyl. Sur Lich. Hepp Obs. Crit., 1854, p. 3). *Secoliga pezizoidea* Stizenb. Krit. Bem. Lec. Nadelf. Sp. (1863) p. 13. *Rhaphiospora viridescens* Mass. Alc. Gen. (1853) p. 12, Koerb. Parerg. Lich. 3 Lief. (1861) p. 239.

Thallus sat crassus aut tenuis, verruculosus, cinereo- aut olivaceo- aut albido-glauescens aut albidus. Apothecia majuscula aut mediocria aut sat parva, basi bene constricta, disco atro, opaco, plano aut demum convexo, margine tenui aut mediocri, atro, opaco, aut rarius pruinoso, persistente aut demum excluso. Hypothecium totum aut superne rubricosum-rufescens aut subviolascens aut partim subfufescens. Hymenium sat tenue. Hymenium superius cyanescenti-nigricans aut subaeruginosum aut raro olivaceum aut partim subdecoloratum, KHO non reagens. Perithecium in margine rubricosum-rufescens aut raro aeruginosum, KHO non reagens. Sporae aciculares, alterum apicem versus attenuatae, longae aut mediocres, septis numerosis. Muscicola aut terricola.

Distr. Supra muscos destructos terricolas et saxicolas et ad ipsam terram arenosam argillaceamve praesertimque locis calcariis passim toto territorio. Variationes hujus speciei inconstantes sunt, saepe in eodem specimine transeuntes.

Var. *chromatophila* Vain.

Hypothecium totum subviolaceum. Perithecium in margine vio-

lascens. Apothecia margine tenui, atro, nudo, persistente aut vulgo demum excluso.

Distr. Alandia (E. Nylander). N.: Ingå (V. Brenner), Helsingforsia (Vain.). Kuus.: Kuoppaoja prope Paanajärvi (Vain.). LPon.: Katschkova (N. I. Fellman).

Thallus sat crassus aut tenuis. Apothecia mediocria aut sat parva, lat. 1—0.3 mm, saepe sat crebra, raro (ad Kuoppaoja in Kuusamo) tuberculoso-prolifera, basi bene constricta, infundibuliformia aut adpressa, disco plano aut vulgo demum convexo. Hypothecium superne intense subviolaceum aut violaceo-rubricosum, subchondroideo-plecten-parenchymaticum, cellulis in seriebus subhorizontalibus, cavitatibus depressis, membranis modice incrassatis, KHO pulchrius coloratum, inferne dilutius coloratum, chondroideum, hyphis irregulariter contextis. Perithecium in margine intense subviolascens, inferne dilutius coloratum aut pallidum, chondroideum. Hymenium circ. 0.050 mm crassum, jodo vinose rubens et primum dilute aut intense caerulescens, aut raro (ad Kuoppaoja in Kuusamo) subpersistenter caerulescens. Epithecium subcyanescenti- aut subaeruginoso-nigricans, KHO non reagens. Paraphyses apice leviter incrassatae. Sporae long. 0.042—0.030, crass. 0.003—0.002 mm. Hypothallus indistinctus. Gonidia pleurococcoidea, saepe demum glomerulosa. — Var. *melanochlora* Vain., perithecio aeruginoso-nigricante ab hac variatione differens, in Sibiria arctica lecta est (conf. *L. atosanguinea* v. *muscorum* in Vain. Lich. Exp. Vegae Pitlek. p. 103).

Var. **terrestris** (Nyl.) Vain. *Lecidea muscorum* forma terrestris Nyl. Herb. Mus. Fenn. (1859) p. 89. *Bacidia atosanguinea* ? *alpina* Th. Fr. Lich. Scand. II (1874) p. 355 (conf. p. 164). *Lecidea muscorum* var. *alpina* Nyl. in Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 320. — Exs. Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 188, VII (1882) n. 320. — Malme, Lich. Suec. Exs. XXIV (1916) n. 588.

Hypothecium superne subviolaceum aut rubricosum-rufescens, inferne pallidum aut subdecoloratum. Perithecium in margine violascens. Apothecia margine tenui, atro, nudo, persistente aut demum excluso.

Distr. Collecta in Ab., N., Ka., KOL., Ta., Tb. (ad Raianlahti in Korpilahti: Vain.), KON. (ad Dianovagora: Th. Simming), Ob. (Ulaurgum: E. Nylander), Kuus. (ad Kitkajoki: F. Silén), Finmarkia (Lyngen: Norrl.), LPon. (Ponoi: N. I. Fellman).

Thallus sat crassus aut tenuis. Apothecia mediocria aut sat parva, lat. 1.4—0.3 mm, saepe crebra aut sat crebra, basi bene constricta, infundibuliformia peltatae aut adpressa, disco plano aut demum convexo. Hypothecium superne subviolaceum, inferne late pallidum aut decoloratum. Perithecium in margine subviolascens, inferne di-

lutius coloratum aut pallidum. Hymenium circ. 0.050—0.055 (0.040—0.060) mm crassum, jodo caerulescens deindeque vinose rubens. Paraphyses sat arcte cohaerentes, apice leviter incrassatae, subcyanescenti- aut subaeruginoso-nigricantes aut raro partim subfuscescentes subolivaceaeve aut partim decoloratae. Sporae long. 0.028—0.034 (0.020—0.052), crass. 0.0015—0.003 mm, vulgo 7—3-septatae. Apothecia crass. circ. 0.320—0.400 mm.

Obs. In specim. orig. *L. muscorum* formae terrestris Nyl. l. c. (ex Hoglandia: E. Nylander) thallus verruculosus, modice incrassatus, sordide albidus, verruculis contiguus, apothecia parva. — *Secoliga pezi-zoidea* var. *β. alpina* (Hepp) Stizenb. l. c. (1863) p. 15, descripta hypothecio pallidoluteo, hymenio 0.075—0.080 mm crasso, epithecio intense fusco, sporis long. 0.068, crass. 0.004—0.005 mm, in monte Pilato in Helvetia ab Hepp collecta, cum *L. muscorum* non congruit, neque haec var. a Th. Fr. l. c. rite describitur. *L. bacillifera* v. *muscorum* f. *alpina* Nyl. Lich. Lapp. Or. (1866) p. 156 ad *Toniniam squalidam* pertinet. *L. bacillifera* **L. muscorum* var. *alpina* Norrl. Bidr. Sydöstr. Tav. Fl. (1870) p. 189, ad Sarvala in Kuhmoin lecta (389), ad *B. abbreviantem* Nyl. pertinet, et in Kissakallio prope Kaila in Asikkala lecta (17319 in herb. Nyl.), ad *B. herbarum* (Hepp) referenda est.

Var. **irrorata** (Th. Fr.) Vain. *Bacidia atrogrisea* *β. irrorata* Th. Fr. Lich. Arct. (1860) p. 180. *B. atosanguinea* *δ. irrorata* Th. Fr. Lich. Scand. II (1874) p. 355. *L. atosanguinea* v. *irrorata* Vain., Adj. Lich. Lapp. II (1883) p. 21.

Hypothecium superne subviolaceum, inferne decoloratum. Perithecium in margine violascens. Apothecia margine modice incrassato, cinereo-pruinoso aut p. p. atro nudoque, persistente aut rarius demum excluso.

Distr. Supra muscos et ad terram in rupe calcaria in regione abietina prope Kuoppaoja (Vain.) et in regione coniferarum mixtarum prope Kitkajoki (F. Silén) in Kuus.

Thallus verruculosus aut verrucosus, tenuis aut modice incrassatus, olivaceus aut cinerascens. Apothecia mediocria aut sat parva, lat. 1.5—0.5 mm, saepe crebra, basi bene constricta, infundibuliformia peltatae, sat elevata, disco plano aut raro demum convexo, margine saepe prominente discumque superante. Hypothecium superne sat tenuiter subviolaceum, parte colorata circ. 0.030—0.050 mm crassa, cavitatibus cellularum depressis, in seriebus irregulariter subhorizontalibus dispositis, membranis modice incrassatis, inferne decoloratum chondroideumque, hyphis irregulariter contextis pachydermaticis, conglutinatis, basi saepe denuo subpurpureum. Perithecium chondroideum, tubulis tenuibus, radiantibus, in margine subviolaceum aut extus pallescens, inferne pallidum aut dilute rubricosum. Hymenium circ. 0.060

mm crassum, jodo caerulescens deindeque vinose rubens. Hymenium superius aeruginoso-nigricans. Sporae aciculares, long. $0.028-0.034$ („ -0.048 “ sec. Nyl.), crass. $0.002-0.003$ mm, pluri-septatae, septis saepe 6.

6. *B. peltigericola* Vain.

Lecidea arceutina Nyl. Fl. 1874 p. 14. „*L. arceutina* peltigericola“ Norrl. Fl. Kar. Oneg. II (1876) p. 31 (determ. Nyl.).

Thallus e verruculis constans sparsis, circ. $0.15-0.1$ mm latis, albido-glauciscentibus. Apothecia parva, sessilia, basi constricta, fuscoatra aut nigricantia, haud pruinosa, disco depresso-convexo, margine concolore, tenuissimo, subpersistente. Hymenium sat tenue. Epithecium aeruginosum aut subcaerulescens, KHO non reagens. Hypothecium plectenparenchymaticum, rubricoso-rufescens. Perithecium subfuscescens. Paraphyses simplices. Sporae vermiculari-aciculares, contortae, sat breves, tenuissimae.

Distr. Supra partes emorientes Peltigerae caninae in Hollola Tavastiae et Valkeamäki in Karelia Onegensi (J. P. Norrlin).

A *B. arceutina* (Ach.) praesertim epithecio caerulescente et hymenio tenuiore et sporis brevioribus differt et magis est similis *Bacidiae muscorum* et *B. umbrinae* Ach. — Thallus verruculis parcis aut evanescens. Apothecia lat. $0.38-0.2$ mm, opaca, sat crebra. Hymenium $0.040-0.060$ mm crassum. Epithecium caeruleo-aeruginosum, partim intense, partim dilute, partim parce etiam subviolaceo-olivaceum, KHO dilutius coloratum. Hypothecium cavitatibus cellularum 0.002 mm latis, rotundatis aut difformibus, irregulariter dispositis, membranis leviter incrassatis, KHO sordide subviolaceo-fuscescens. Perithecium cavitatibus oblongis aut difformibus, 0.002 mm crassis, nigricanti- aut subviolascens-fuscescens, KHO sordide subviolaceo-fuscescens. Paraphyses arcte cohaerentes, variabiles, tenuiores crassioresve, saepe superne sensim incrassatae, haud raro apice clavatae. Asci clavati. Sporae 8-nae, leviter aut bene contortae, aciculares, at spiraliter flexuosae, long. $0.028-0.040$, crass. 0.001 mm. Gonidia pleuro-coccoidea, cellulis globosis, diam. $0.008-0.015$ mm, vulgo simplicia, etiam glomerulosa. Nylander sec. annot. in herb. suo in specimine ex Hollola (n. 17929) conidangia observavit conidiis instructa „filiformibus, arcuatis“.

7. *B. inornata* (Nyl.) Blomb. et Forss.

Enum. Pl. Scand. (Points-Fört. Skand. Växt. 1880) p. 81. *Lecidea* Nyl. Fl. 1874 p. 11; Hue, Addend. Lich. Eur. II (1888) p. 163.

Thallus sat tenuis, verruculoso-inaequalis, partim dispersus, cinereo-glauescens. Apothecia mediocria, nigra aut fusconigra, adnata, basi constricta, disco demum convexo, margine tenui, demum excluso. Hypothecium violaceo-purpureum. Hymenium modice incrassatum, totum decoloratum. Sporae aciculares, rectae, longitudine mediocres, gracillimae, septis pluribus, parum conspicuis.

Distr. In latere saxi loco umbroso in pineto prope Nyystölä in Padasjoki Tavastiae austr. (Vain.) cum *Thelenella corrosa* (Koerb.).

A *B. incompta* (Borr.) praesertim epithecio decolorato differt. — Thallus haud sorediosus, opacus, hypothallo indistincto. Apothecia lat. 0.6—0.7 mm, crass. circ. 0.25 mm, haud pruinosa, disco opaco, margine haud prominente, leviter nitido. Hypothecium et perithecium violaceo-purpureum, KHO parum reagens. Hymenium jodo obsolete caerulescens, dein vinose fulvescens (secund. Nyl. l. c.). Paraphyses simplices, crass. 0.001 mm, apice haud incrassatae. Sporae long. 0.032—0.036, crass. 0.001—0.0015 mm, septis 5 obsoletis vel nullis (secund. Nyl. l. c.). Pycnidia papillaria, alt. 0.140, crass. 0.130 mm, violaceo-purpurea. Basidia brevia, simplicia. Stylosporae (macroconidia) oblongae, lateribus cylindricis, rectae, apicibus rotundatis, decolores, long. 0.005—0.006, crass. 0.0015 mm. Gonidia pleurococcoidea. Pycnidia numerosa, sed tantum 2 apothecia bene evoluta legi, quare ea microscopio examinando perdere nolui.

8. *B. incompta* (Borr.) Anzi

Cat. Lich. Sondr. (1860) p. 70, Lich. Ital. Sup. (1865) n. 260; Arn. Lich. Fragm. XI (Fl. 1871) p. 52, Lich. Monac. Exs. (1895) n. 411, Lich. Exs. (1896) n. 1709; Th. Fr. Lich. Scand. (1874) p. 361; Malme Lich. Suec. Exs. XVI (1914) n. 386 a, b. *Lecidea* Borr. Suppl. Engl. Bot. (1834) tab. 2699; Leight. Lich. Exs. V (1854) n. 162; Nyl. Fl. 1869 p. 296. *Biatora* Hepp Flecht. Eur. V (1857) n. 287. *Secoliga atrosanguinea* b. *incompta* Stizenb. Krit. Bem. Lec. Nadelf. Sp. (1863) p. 19. *Bacidia bacillifera* b. *incompta* Branth et Rostr. Lich. Dan. (1869) p. 109. *Lecidea parasema* v. *microcarpa* b. *flocculosa* Flot. Lich. Schles. (1829) n. 91 C, („f. *vetusta*“) n. 93. *Scoliosporum molle* Mass. Ric. Lich. Crost.

(1852) p. 105, Sched. Crit. (1855) p. 162; Koerb. Syst. Lich. Germ. (1855) p. 269; Rabenh. Lich. Eur. XVII (1859) n. 496. *Bacidia mollis* Zwackh Lich. Exs. (1859) n. 335, (1861) n. 397; Hellb. Ner. Laffl. (1871) p. 79. *Lecidea anomala* ð. *atrosanguinea* Schaer. Lich. Helv. Exs. IX (1833) n. 212. *Biatora rubella* b. *atrosanguinea* Hepp Syst. Samml. (1852) n. 233. *Biatora abstrusa* Rabenh. Deutschl. Krypt.-Fl. II (1845) p. 94. *Bacidia holomelaena* c. *corticicola* Anzi Cat. Lich. Sondr. (1860) p. 71, Lich. Langob. VII (1861) n. 260 a, b, XIII (1868) n. 515.

Exs. Flot. l. c. (det. Nyl. in hb. suo). — Schaer. l. c. (secund. specim. orig. in hb. Nyl.). — Hepp l. c. (secund. Stizenb. l. c.). — Leight. l. c. — Mass. Lich. Exs. Ital. IX (1856) n. 317 (ex Arn. Lich. Fränk. Jur. p. 188). — Zwackh l. c. — Rabenh. Lich. Eur. XVII (1859) n. 496. — Jack, Leiner et Stizenb. Krypt. Bad. (1860) n. 128 a, b (ex Arn. l. c.). — Mudd Lich. Brit. Exs. II (1861) n. 151 (Arn. l. c.). — Anzi Lich. Langob. VII (1861) n. 260, XIII (1868) n. 515 (secund. Jatta Fl. It. Crypt. Lich. 582). — Wartm. et Schenk Schweiz. Krypt. (1862) n. 69 (Arn. l. c.). — Anzi Lich. Ital. Sup. VI (1865) n. 260 (hb. Nyl.). — Koerb. Lich. Select. Germ. XII n. 345 (hb. Nyl.). — Oliv. Herb. Lich. de l'Orn. (1880) n. 37 (Arn. l. c.). — Roumegu. Lich. Gall. Exs. n. 393 (Arn. l. c.). — Arn. Lich. Monac. (1895) n. 411, Lich. Exs. (1896) n. 1709. — Malmé l. c.

Thallus modice incrassatus aut rarius sat tenuis vel sat crassus, verruculoso- aut verrucoso-inaequalis, albidus- aut cinereo-glauescens. Apothecia sat parva aut medio-cria, atra aut raro p. p. fusconigra vel livido-fuscescentia, adpressa, late adnata, disco plano aut rarius demum convexo, margine tenui, persistente aut demum excluso. Hypothecium purpureo-rubricosum aut fusco-purpureum. Hymenium tenue, totum aut partim dilute purpureum aut pallidum. Sporae 3-septatae, breves, tenues, aciculares.

Var. **flocculosa** (Flot.) Vain.

Apothecia atra.

Ad terram in ruinis Castelli Kajanensis (Vain.). — Secundum specimen ad Kildale in Anglia a W. Mudd lectum (in Leight. Lich. Exs. n. 162 in mus. Fenn.) hic describitur. — Hypothallus indistinctus. Apothecia sat crebra, lat. 0.7–0.3 mm, basi parum aut leviter constricta, haud pruinosa. Perithecium fusco-purpureum, KHO non reagens, subchondroideum, ex hyphis formatum radiantibus, cavitatibus sat tenuibus, oblongis, membranis leviter incrassatis. Hypothecium superne subplectenparenchymaticum, cavitatibus cellularum vulgo rotundatis, circ. 0.0015–0.002 mm latis, irregulariter dispositis, membranis modice incrassatis, inferne chondroideum membranisque crassioribus

et cavitatibus partim oblongis, totum intense coloratum. Hymenium circ. 0.040 mm crassum, jodo caerulescens deindeque vinose rubens. Epithecium partim pallidum. Paraphyses arcte cohaerentes, simplices, septatae, apice 0.0015 mm crassae, basin versus tenuiores. Sporae aciculares, altero apice obtuso aut apicibus ambobus obtusis, rectae aut sat rectae, 3-septatae, long. 0.030—0.017, crass. 0.003—0.0015 mm. Conidia „acicularia, leviter aut partim parce bene arcuata, crass. 0.0005, long. 0.011—0.009 mm“ (annot. Nyl. in sched. n. 17751) aut „0.008—0.006 mm“ (in n. 17740 in herb. Nyl.). Gonidia pleurococcoidea, globosa, diam. 0.010—0.006 mm, vulgo glomerulosa, membrana modice incrassata.

Var. *leprifera* Vain. *L. incompta* f. *minor* Vain. Adj. Lich. Lapp. II (1883) p. 21.

Apothecia disco fusco-nigricante, pallidiore, quam in var. *flocculosa*. Thallus sat crassus.

Distr. Kb.: Koukonvuori in Lieksa (Vain.). Supra muscos in latere orientali rupis.

Cum *Secoliga atosanguinea* b. *incompta* f. *minore* Stizenb. (Krit. Bem. Lec. Nadelf. Sp. p. 20) non est omnino identica, loco natali, colore thalli cinereo- vel olivaceo-fuscescente et margine apotheciorum livido et nigricante, variabili ab ea differens. Thallus verruculis minutis, subsidioides-connatis. Hymenium 0.040—0.060 mm crassum, decoloratum aut saepe totum violaceo-rubellum, jodo caerulescens deindeque vinose rubens. Hypothecium violaceo-rubricosum. Perithecium intense aut dilute violaceum. Paraphyses sat arcte cohaerentes, numerosae. Sporae aciculares, rectae aut leviter flexuosae, septis indistinctis, long. 0.038—0.026, crass. 0.0025—0.0015 mm. Apothecia lat. 0.5—0.3 mm, disco primum concavo planiusculove, demum depresso-convexo, margine tenui, prominente aut demum excluso. — Var. *decolorascens* Nyl. (Bot. Zeit. 1861 p. 338, Arn. Lich. Fränk. Jur., 1884, p. 188), disco apotheciorum livido et thallo sat tenui, cinereo-glauescente ab hac varietate differens, ad corticem Populi in Bavaria a Fr. Arnold lecta est. Nonnullis apotheciis ad eam pertinet etiam n. 386 a in Malme Lich. Suec. Exs.

9. *B. herbarum* (Hepp) Arn.

Fl. 1865 p. 596, Lich. Fragm. XI (Fl. 1871) p. 55; Th. Fr. Bot. Not. 1866 p. 14, Lich. Scand. II (1874) p. 349. *Secoliga herbarum* (Hepp) Stizenb. Krit. Bem. Lec. Nadelf. Sp. (1863) p. 46. *Lecidea* Nyl. in Norrl. Fl. Kar. Oneg. II (1876) p. 31; Stizenb. Ind. Lich. Hyperb. (1876) p. 42; Nyl. Enum. Lich. Fret. Behr. (1888) p. 23, 54. *Lecidea bacillifera* var. *herbarum* Nyl. Lich. Lapp. Or. (1866) p. 155. *L. bacillifera* **herbarum* Nyl. in Norrl. Bidr. Sydöstr. Tav. Fl. (1870) p. 349. *Bacidia effusa* v. *musciicola* Hepp in Stizenb. l. c. (1863) p. 46 (Arn. Lich. Fränk.

Jur., Fl. 1858, p. 505, sine descr., teste Arn. Lich. Fränk. Jur., 1884, p. 184). *Mycobacidia herbarum* Rehm in Rabenh. Krypt.-Fl. Deutschl. Ascom. (1896) p. 338; Sacc. Syll. Fung. X (1892) p. 66.

Exs. Arn. Lich. Exs. (1865) n. 290.

Thallus tenuis aut raro modice incrassatus, verruculosus aut verniceus et sat laevigatus, cinerascens vel albido-glauescens. Apothecia sat parva aut mediocria, sessilia, basi bene constricta, disco persistenter plano aut demum depresso-convexo, versicolore, testaceo aut rufescente aut castaneo- vel umbrino-fuscescente aut umbrino-nigricante, margine tenui aut sat tenui, concolore, persistente aut demum excluso. Hymenium modice incrassatum, epithecio decolorato aut pallido. Hypothecium superne rubricoso- aut pallido-rufescens, KHO parum reagens, plectenparenchymaticum, inferne subdecoloratum chondroideumque. Perithecium extus vulgo tenuiter plectenparenchymaticum, intus chondroideum. Sporae aciculares, longitudine mediocres, gracillimae, sat rectae, pluri-septatae.

Distr. Supra muscos vetustos et alias plantas destructas ad terram rara. — Al.: Bastö (E. Nylander, teste Th. Fr. l. c.). N.: Raseborg (A. Kullhem). Ta.: Hovila in Hollola (Vain.), Kissakallio prope Kaila et ad Templum in Asikkala (J. P. Norrlin). KOn.: Ad calcifodinas in Suojärvi (Norrl.). LPon.: Ponoï (N. I. Fellman).

Thallus opacus aut leviter nitidus, hypothallo indistincto. Apothecia vulgo haud numerosa, lat. 0.4—0.7, raro — 1.5 mm, crass. circ. 0.360—0.520 mm, haud pruinosa, saepe versicoloria in eodem specimine, disco opaco, interdum subconcavo, margine nitido aut opaco, bene prominente aut disco haud superante aut demum excluso. Hymenium 0.060—0.055 mm crassum, jodo caerulescens, dein vinose rubens. Epithecium decoloratum aut pallidum. Hypothecium in parte superiore cavitatibus cellularum bene depressis aut subglobosis, 0.0015—0.002 mm latis, in seriebus horizontalibus aut in medio apothecii subverticalibus, membranis sat tenuibus aut sat bene incrassatis, inferne irregulariter contextum, decoloratum aut pallidum. Perithecium ex hyphis radiantibus, conglutinatis formatum, chondroideum, cavitatibus cellularum oblongis elongatisve, 0.0015 mm latis, membranis sat modice incrassatis, aut in superficie perithecii cellulis subglobosis, 0.006—0.008 mm latis, in 1—2 seriebus dispositis, in margine totum aut

intus rubricosus-rufescens, ceterum pallidum aut partim decoloratum aut intus plus minus late dilute rufescens. Paraphyses arcte cohaerentes, simplices, crass. 0.001 mm, apice clavato-capitatae et crass. 0.0015 mm. Sporae aciculares, alterum apicem versus attenuatae, long. circ. 0.028—0.038, crass. 0.0015—0.002 mm (aut „long. 0.036—0.048, crass. 0.0015—0.0025 mm“ secundum Nyl. in herb. suo, aut „long. 0.040—0.060, crass. 0.0015—0.003 mm“ observante Stizenb. l. c.). Gonidia pleurococcoidea.

10. *B. Arnoldiana* Koerb.

Lich. Select. Germ. (1857) n. 131, Fl. 1858 p. 134; Arn. Fl. 1858 p. 508, Lich. Fragm. XI (Fl. 1871) p. 54; Th. Fr. Lich. Scand. II (1874) p. 351; Flagey Fl. Lich. Franche-Comt. II (1886) p. 353. *Bacidia Arnoldiana* *a. vulgaris* Koerb. Parerg. Lich. 2 Lief. (1860) p. 134. *Patellaria Arnoldiana* Müll. Arg. Princ. Class. (1862) p. 400. *Lecidea Larbalestieri* Cromb. in Grevillea 1879 p. 143; Vain. Adj. Lich. Lapp. II (1883) p. 16.

Exs. Zwackh Lich. Exs. (1854) n. 235, (1876) n. 459, (1883) n. 781, (1886) n. 981. — Hepp Flecht. Eur. II (1857) n. 289 p. p. — Koerb. Lich. Select. Germ. (1857) n. 131. — Lojka Lich. Regn. Hung. Exs. II (1882) n. 64. — Arn. Lich. Exs. (1888) n. 1394, Lich. Monac. Exs. (1896) n. 442.

Thallus vulgo modice incrassatus, verrucoso-inaequalis aut areolato-diffractus, albido- vel glauco-cinerascens. Apothecia minuta, sessilia, adnata, basi bene constricta, disco persistenter plano aut demum convexo, vulgo cinereo-fuscescente aut rarius fusco-nigricante pallescenteve, nudo, opaco, margine concolore aut saepe cinerascens, sat tenui, persistente aut demum excluso. Hymenium sat tenue, totum decoloratum aut superne pallidum. Hypothecium superne rufescens vel rubricosus- aut partim pallido-rufescens, KHO non reagens, chondroideo-subplectenparenchymaticum, inferne dilutius coloratum aut pallidum decoloratumve, irregulariter chondroideum. Perithecium in margine extusque plectenparenchymaticum. Sporae aciculares, sat longae, sat rectae, graciles.

Distr. Praesertim ad saxa calcaria, rarius ad cortices crescit. In parte subdissoluta rupis graniticae Ruskeakallio in Kuus. (F. Silén).

Thallus modice incrassatus aut sat tenuis aut interdum crassus, raro areolis sat laevigatis (Koerb. l. c. n. 131), hypothallo indistincto aut albo. Apothecia sparsa aut sat crebra, lat. 0.4—0.6 (0.3—0.8) mm, crass. 0.160—0.330 mm, humida ob hypothecium translucens obscuriora nigricantiave, etiam apothecia pallida humida saltem partim aut tantum perithecio margineve rufescentia evadunt. Hypothecium superne partim cellulis valde depressis et ad marginem in seriebus horizontalibus, ceterum irregulariter dispositis, membranis modice incrassatis, cavitatibus valde angustis, inferne hyphis irregulariter contextis, magis pachydermatis, cavitatibus longioribus, angustis. Perithecium in margine, praesertim intus, rufescens aut rubricosorufescens, KHO non reagens aut subfuscescens, extus et inferne totum decoloratum aut subpallidum, plectenparenchymaticum, ex hyphis radiantibus, conglutinatissimum formatum, cavitatibus ellipsoideis oblongisve aut globosis, lat. 0.0015—0.004 mm, membranis modice incrassatis, partim intus chondroideum, membranis crassioribus et cavitatibus angustis. Hymenium 0.050—0.060 mm crassum, jodo caerulescens deindeque vinose rubens. Paraphyses arcte cohaerentes, crass. 0.001 mm, apice 0.0015 mm, simplices. Sporae 8-nae, aciculares, altero apice sensim attenuato, altero acuto obtusove aut apicibus ambobus obtusis, 3—5-septatae (etiam 6-septatae, observante Stizenb. l. c.), long. 0.027—0.037 (—0.040, secundum Nyl. in herb. suo), crass. 0.002—0.003 mm (0.02—0.001 mm, sec. Nyl. in herb. suo). Conidia 3 formarum Nyl. in herb. suo descripsit: 1) filiformia, bene arcuata, long. 0.021—0.026, crass. 0.0005 mm in specimine n. 17586 c prope Rochechouard (Haute-Vienne) ab E. Lamy collecto, 2) fusiformi-acicularia, recta aut levissime arcuata, apices ambos versus sensim attenuata, long. 0.024—0.044, crass. 0.001 mm in specimine n. 17589 circa Thermas Herculis in Hungaria ab H. Lojka lecto, 3) fusiformi-acicularia, modice arcuata, apices ambos versus sensim attenuata, long. 0.025—0.030, crass. 0.001 mm in specimine n. 17586 in Villa Franca a Fuzet lecto. Gonidia pleurococcoidea, diam. 0.006—0.008 mm, simplicia aut raro 2-cellulosa in Koerb. l. c. n. 131, aut 2—4-cellulosa aut glomerulosa in Zwackh l. c. n. 235.

Obs. *Biatora modesta* Zwackh Lich. Exs. n. 332 A, B, *Bacidia Arnoldiana* f. *modesta* Arn. Lich. Fragm. XI p. 54, Lich. Fränk. Jur. p. 184, *Secoliga inundata* f. *corticola* Stizenb. l. c. p. 38 p. p., thallo minutissime granuloso a *Bacidia Arnoldiana* Koerb. differt, hypothecio rubricosorufescente, KHO non reagente ei congruens (sporis 3—7-septatis sec. Stizenb., l. c. tab. II f. 15). Ad corticem Fagi et Castaneae prope Heidelbergam a Zwackh lecta est (n. 17593 et 17587 b in herb. Nyl.). *Bacidia inundata* b. *corticola* Krempelsh., Lich. Bayerns (1861)

p. 225 (*Secoliga inundata* f. *corticola* Stizenb. l. c. p. 38 p. p.), thallo verruculoso-inaequali, typico instructa, vix nisi statione a var. *Larba-lestieri* Vain. differt et ad corticem Abietis prope Eichstätt ab Arnold lecta est (hypothecio pallido-rufescente, sporis 5--7-septatis, long. circ. 0.027, crass. 0.0035 mm secund. annot. Nylandri in n. 17587 a in herb. Nyl.).

11. *B. dolera* (Nyl.) Blomb. et Forss.

Enum. Plant. Scand. (1880) p. 81. *Lecidea dolera* Nyl. Fl. 1873 p. 20.

Thallus sat tenuis, verrucoso- et verruculoso-inaequalis, albidus. Apothecia fere mediocria, sessilia, late adnata, basi parum constricta, disco plano, fusco („aut fuscurofu“ sec. Nyl.), nudo, sat opaco, margine atro, persistente. Hymenium sat tenue, superne pallidum. Hypothecium totum fuscum. Perithecium chondroideum. Sporae aciculares, longitudine mediocres, rectae, graciles.

Distr. Ad corticem abietis in Pihlajavesi in Tb. (J. P. Norrlin).

Facie externa vix differt a *Lecidea erythrophaea* f. *tenebricosa* Nyl. Thallus verrucis 0.15—0.5 mm latis, convexis aut sat planis, KHO non reagentibus, hypothallo indistincto. Apothecia „lat. 0.5—0.9 mm“ (sec. Nyl.), crass. circ. 0.230 mm, KHO non reagentia. Perithecium fuscum, extus rufescens aut subdecoratum, ex hyphis formatum radiantibus, conglutinatis, membranis paulum incrassatis, cavitatibus cellularum oblongis, 0.001 mm latis. Hypothecium ex hyphis formatum irregulariter contextis, conglutinatis, membranis leviter incrassatis, cavitatibus angustis, oblongis. Hymenium circ. 0.045—0.060 mm crassum, „jodo persistenter caerulescens“ (sec. Nyl.). Epithecium supra apices paraphysum strato tenui gelatinoso obductum. Paraphyses arcte cohaerentes, simplices, crass. vix 0.001 mm, apice parum incrassatae. „Sporae 8-nae, long. 0.030—0.032, crass. 0.002 mm“ sec. Nyl. Gonidia pleurococcoidea, vulgo globosa, simplicia diam. 0.005—0.008 (—0.014) mm, saepe etiam 2-cellulosa et demum glomerulosa, membrana modice aliquantumve incrassata.

12. *B. sparsa* Kullh.

Not. Sällsk. F. et Fl. Fenn. Förh. XI (1871) p. 273; Th. Fr. Lich. Scand. II (1874) p. 359.

Thallus tenuis, e verruculis constans minutissimis vel granuliformibus, glaucescentibus aut cinereo-glaucescentibus, dispersis aut partim contiguis. Apothecia minuta aut raro mediocria, sessilia, late adnata, basi distincte constricta, disco persistenter plano aut raro leviter convexo, badio-fusco, nudo, opaco, margine sat tenui, vulgo badio-pallescente, opaco, persistente. Hymenium modice incrassatum, epithecio sordide pallido, KHO non reagente. Hypothecium superne dilute sordide roseolo-fuscescens, KHO subviolaceo-rubescens, plectenparenchymaticum, inferne decoloratum chondroideumque. Perithecium extus subplectenparenchymaticum, intus chondroideum. Sporae vulgo subbacillares, longitudine mediocres, modice incrassatae, sat rectae, pluri-septatae.

Distr. Ad truncum putridum prope Pähkijärvi in Tammela in Ta. (A. Kullhem) una cum fungis.

Buelliae herbarum est affinis. — Thallus opacus, hypothallo indistincto. Apothecia sparsa, lat. 0.6—0.35 mm, crass. circ. 0.250 mm, haud pruinosa, margine saepe primum prominente. Hymenium 0.060—0.055 mm crassum, jodo caerulescens, dein vinose rubens. Hypothecium in parte superiore cavitatibus vulgo depressis, 0.0015—0.003 mm latis, in series horizontales dispositis, membranis leviter incrassatis, in parte inferiore chondroideum, membranis bene incrassatis, cavitatibus cellularum oblongis vel elongatis, 0.001—0.0015 mm latis, irregulariter dispositis. Perithecium ex hyphis radiantibus conglutinatis, modice pachydermaticis formatum, cavitatibus oblongis, 0.0015 mm latis, in parte exteriori rotundatis et 0.0015—0.003 mm latis, in margine extus pallidum et intus hypothecio concolor, ceterum decoloratum. Paraphyses numerosae, arcte cohaerentes, simplices, apice crass. 0.0015 mm, ceterum tubulis 0.001 mm crassis, leviter gelatinosae. Sporae vulgo subbacillares, apicibus sat obtusis, aut altero apice sat attenuato, rectae aut leviter curvatae, vulgo 5-septatae, („3—7-septatae“, observante Kullh.), long. 0.026—0.040, crass. 0.002 mm („long. 0.020—0.030, crass. 0.0025—0.003 mm“ sec. Th. Fr., l. c.).

Sect. 2. *Hypothecium pallidum aut dilute coloratum aut raro rubescens.*

Ser. 1. *Hymenium crassum* (crass. circ. 0.120—0.060 mm).

13. *B. subacerina* Vain.

Lecidea endoleuca f. *subacerina* Nyl. in litt. (ined.). *L. acerina* Nyl. Fl. 1872 p. 315 (Hue Addend. Lich. Eur., 1886, p. 164) p. p. (sec. herb. suo); Zwackh Lich. Exs. (1879) n. 532; Norrl. et Nyl. Herb. Lich. Fenn. (1882) n. 315; Th. Fr. Lich. Scand. (1874) p. 347 p. p. (excl. *Lichene acerino* Pers.). *Bacidia acerina* Malme Lich. Suec. Exs. (1897) n. 29, 30. *L. endoleuca* Vain. Fl. Tav. Or. (1878) p. 114.

Exs. Norrl. et Nyl. l. c. — Malme l. c.

Thallus crustaceus, tenuis, verrucis verruculisve dispersis, vulgo depressis, parce instructus, albidus aut albido-glauescens. Apothecia majuscula aut mediocria, subfusca aut nigricantia aut raro rufescentia, elevata aut adpressa, sessilia, disco plano aut demum convexo, margine sat tenui, persistente aut demum excluso. Hypothecium decoloratum aut partim pallidum aut maculis subrubricosis, KHO non reagens. Hymenium crassum. Epithecium purpureo-rubricosum aut rubricosum-rufescens, KHO subviolaceo-rubricosum aut demum decoloratum. Perithecium extus rufescens aut partim sat dilute rubricosum, KHO purpureo-rubricosum, intus decoloratum aut dilute rufescens. Sporae aciculares, longae, long. 0.088—0.050, crass. 0.003—0.002 mm.

Distr. Ad corticem Abietis, raro Sorbi (n. 2, 3). N.: Prope Helsingforsiam (Vain.), Vihti (W. Nyl.). IKar.: Vammelsuu in Uusikirkko (A. O. Kairamo). Ta.: Pähkijärvi (2) in Tammela (A. Kullhem), Tiirismaa in Hollola (J. P. Norrlin, Vain.), Soima (3) in Korpilahti (Vain.). KOL.: Mandroga (F. Elfving).

Apothecia sparsa aut sat crebra, basi bene constricta lat. 1—0.5 mm, crass. 0.260—0.310 mm, haud pruinosa, margine disco concolore, discum haud superante, haud aut leviter nitido. Perithecium chondroideum, ex hyphis formatum radiantibus, modice pachydermatis, cavitatibus oblongis aut elongatis, 0.0005—0.0015 mm latis. Hypothecium superne decoloratum aut pallidum aut maculis pallido-rubricosis, praesertim ad marginem, subchondroideum, cavitatibus brevibus, vulgo depressis, 0.0015—0.002 mm latis, in seriebus irregulariter subhorizontalibus, membranis modice pachydermatis, inferne decoloratum, irregulariter chondroideum, tubulis tenuibus, membranis incrassatis. Hymenium 0.080—0.060 mm crassum, jodo persistenter caerulescens aut (in n. 2) demum

vinose rubens. Epithecium purpureo-rubricosum aut rubricosorufescens, KHO pulchrius purpureum aut materia colorata demum dissoluta. Paraphyses sat laxe cohaerentes, simplices, crass. 0.001—0.0007 mm, apice saepe leviter incrassatae (0.0015 mm), simplices. Sporae aciculares, rectiusculae, apicibus acutis aut superioribus obtusis, pluri-septatae (septis — 13), long. 0.080—0.050, crass. 0.003—0.002 mm. Conidia filiformia, „arcuata, long. 0.015—0.018 mm“ (sec. Nyl. Lich. Paris p. 83).

Var. *brachysporella* Vain. *L. endoleuca* f. *brachysporella* Vain. Adj. Lich. Lapp. II (1883) p. 14.

Hypothecium dilute fuscescens, KHO paullo intensius coloratum. Apothecia nigra. Sporae breviores, long. 0.046—0.021, crass. 0.004—0.0025 mm.

Ad corticem Abietis in abiegnio. Karelia bor.: Koriseva in Lieksa (Vain.). — Ad formas inter *B. subacerinam* et **B. laurocerasi* intermedias pertinet, colore hypothecii et sporis brevioribus ab ambabus differens. Habitu priori similis, apotheciis basi bene constrictis.

**B. laurocerasi* (Del.) Vain.

Patellaria laurocerasi Del. in Dub. Bot. Gall. II (1830) p. 653. *Raphiospora atosanguinea* β . *lecideina* Koerb. Lich. Sel. Germ. VIII (1861) n. 228 (in herb. Nyl.).

Thallus tenuis aut sat tenuis, leviter verrucoso-inaequalis, continuus, albido- aut subcinereo-glauescens. Apothecia mediocria, lat. 0.6—0.4 mm, adpressa et late adnata, basi leviter constricta, disco plano aut depresso-convexo, fusco-rufescente fuscescenteve, margine tenui. Hypothecium superne dilute rubescenti-rufescens aut (in apotheciis rufescentibus) pallidum et ad marginem anguste rubricosum, KHO non reagens. Hymenium crassum. Epithecium fusco-fuligineum aut sordide subpurpureo-fuligineum, KHO paullo dilutius coloratum. Perithecium decoloratum aut in margine rufescens, KHO non reagens. Sporae aciculares, longae.

Distr. Typica nondum in Fennia collecta (videas p. 176).

Apothecia crass. 0.220—0.200 mm, haud pruinosa, disco sat opaco, margine discum haud superante, fusco aut rufescente, disco saepe obscuriore, interdum leviter nitido. Perithecium chondroideum, ex hyphis formatum radiantibus, pachydermatis, conglutinatibus, cavitatibus cellularum oblongis, 0.002—0.0005 mm latis. Hypothecium superne subchondroideum, cavitatibus rotundatis, 0.0015—0.002 mm latis, in seriebus irregularibus, membranibus pachydermatis, inferne irregulariter chondroideum, tubulis tenuibus, membranibus incrassatis. Hymenium 0.090—0.070 mm crassum, inferne decoloratum aut dilute rufescens, jodo persistenter caerulescens (aut, observante Nyl., demum vinose rubens).

Paraphyses simplices, crass. 0.001 mm, apice subfuligineo-clavatae et crass. 0.002–0.005 mm. Sporae rectiusculae, apice inferiore sensim attenuato, altero apice vulgo obtuso, long. „0.053–0.075“ (observante Nyl.), crass. 0.003–0.0045 mm (secundum specim. orig. n. 17070 in herb. Nyl., ad Vire in Gallia a Lenormand lectum). — Apotheciis tenuioribus, magis adnatis, paraphysibus apice crassioribus et hypothecio magis colorato a *B. subacerina* differt, sed non est autonoma species. Specimina intermedia, hypothecio instructa ad marginem dilute rufescente rubricosove, potius ad *B. subacerinam* pertinentia et p. 174 indicata, in Vihti (W. Nyl.), Tiirismaa (Norrl.), Uusikirkko (Kairamo) et Karelia Olonets. (Elf.) collecta sunt.

14. **B. atrogrisea* (Hepp) Vain.

Biatora atrogrisea Hepp Flecht. Eur. (1853) n. 26 (*Lecidea* Del. in Hepp Syst. Samml., 1857, n. 222). *Secoliga* Stizenb. Krit. Bem. Lec. Nadelf. Sp. (1863) p. 62 p. min. p.

Thallus sat tenuis aut tenuis, leviter verrucoso-inaequalis, albedo- aut cinereo-glauescens. Apothecia majuscula aut mediocria, atra, elevata aut adpressa, sessilia, disco plano aut demum leviter convexo, margine sat tenui, subpersistente. Hypothecium superne pallidum, in limite perithecii rubricosum, KHO non reagens, inferne decoloratum. Hymenium crassum. Epithecium nigricanti-fuligineum, KHO obscure subolivaceo-fuscescens (haud purpureum). Perithecium extus rubricosum (KHO non reagens), intus decoloratum aut in margine dilute rubricosum. Sporae acicularis, „long. 0.067–0.036 mm“ (ex Hepp l. c. n. 26), crass. 0.003 mm.

Distr. Specimina n. 26, supra citata et hic descripta, ad corticem Coryli prope Tigurum in Helvetia ab Hepp collecta sunt (Syst. Samml. n. 222 a me non visus). — Planta huic multum congruens ad corticem Populi prope Kuivajärvi in Tammela Tavastiae austr. ab A. Kullhem lecta est.

Hypothallus indistinctus. Apothecia partim crebra, lat. 0.9–0.4 mm, basi leviter constricta, late adnata, crass. circ. 0.290 mm, haud pruinosa, margine discum haud superante. Perithecium ex hyphis formatum pachydermaticis, radiantibus, cavitatibus angustis, oblongo-elongatis, in superficie perithecii passim parce

ellipsoideis et 0.003 mm latis. Hypothecium superne subchondroideum, cavitatibus brevibus, vulgo depressis, 0.0015 (—0.002) mm latis, in seriebus subhorizontalibus aut irregularibus, membranarum modice pachydermaticis, inferne irregulariter chondroideum, tubulis tenuibus, membranarum incrassatis. Hymenium 0.090—0.080 mm crassum, jodo persistenter caerulescens. Paraphyses simplices, apice clavato-incrassatae, clava 0.003 mm crassa. Sporae rectiusculae, apice inferiore sensim attenuato, altero apice obtuso aut subacuto, „septis transversis 5—15“. — Apotheciis omnino atris et epithecio haud purpureo a *B. subacerina* et **B. laurocerasi* differt, at species autonoma non sit. — Specimen in Tammella lectum, apotheciis atris et epithecio nigricanti-vel olivaceo-fuligineo cum **B. atrogrisea* congruens, statura apotheciorum *B. subacerinae* est similis. Epithecium KHO subfusco-fuligineum. Hymenium jodo caerulescens, dein vinose rubens. Hypothecium superne pallidum. Paraphyses crass. 0.001 mm, apice haud aut leviter incrassatae. Sporae aciculares, long. 0.070—0.060, crass. 0.0025—0.002 mm, flexuosae aut subrectae, septis 16.

Obs. 1. *B. endoleuca* (Nyl.) Vain. „*Biatorae luteolae* status (*endoleuca* in litt.)“ Nyl. Bot. Not. 1853 p. 98 („quae *L. premnea* Hook. Brit. Fl. p. 176, *Biatora premnea* Leight. Lich. Brit. Exs. n. 90“). Thallus tenuis aut sat tenuis, leviter verrucoso-inaequalis, albedo- aut cinereo-glauescens, hypothallo indistincto. Apothecia vulgo dispersa, mediocria aut majuscula, lat. 1.3—0.4 mm, adpressa et late adnata, basi leviter constricta, crass. circ. 0.300—0.290 mm, atra, haud pruinosa, disco convexo, primum plano, opaco, margine tenui, opaco, dein mox excluso. Perithecium extus purpureo-fuligineum, KHO leviter subpurpureo-reagens, intus dilute rubricosum aut decoloratum, chondroideum, ex hyphis formatum radiantibus, pachydermaticis, conglutinatiss, cavitatibus oblongis aut elongatis, 0.001 mm latis. Hypothecium superne pallidum et partim praesertimque marginem versus dilute rubricosum, KHO non reagens, subchondroideo-plectenparenchymaticum, cavitatibus rotundatis aut depressis brevibusque, 0.002—0.0015 mm latis, in seriebus irregulariter verticalibus, membranarum modice incrassatis, inferne decoloratam, irregulariter chondroideum, tubulis tenuibus, membranarum incrassatis. Hymenium 0.100—0.090 mm crassum, jodo persistenter caerulescens. Hymenium superius cyanescenti-nigricans (partim ad marginem anguste subpurpureum), KHO non reagens. Paraphyses sat arcte cohaerentes, simplices, crass. 0.0015 mm, apice cyaneo-nigricanti-clavatae, clava 0.002 (—0.003) mm crassa. Sporae 8-nae, rectae, aciculares, septis transversis circ. 7—10, altero apice attenuato, altero obtuso aut acuto, long. 0.052—0.042, crass. 0.003 mm, ex annot. Nylandri „long. 0.066—0.052, crass. 0.0045 mm“. — Forsan est autonoma species, colore epithecii ab affinibus differens. — Ad corticem arboris prope Shrews-

bury in Shropshire in Britannia (Leight. l. c.). — Conidia arcuata, long. 0.012—0.015, crass. 0.001 mm in „*L. endoleuca*“ Nyl. (Fl. 1869 p. 295), forsán ad *B. subacerinam* pertinente. — Ad *B. endoleucam* Vain. etiam Zwackh Lich. Exs. n. 85 C pertinet.

Obs. 2. *Bacidia intermissa* (Nyl.) Vain. [Malme Bot. Not. 1895 p. 208, Lich. Suec. Exs. (1895) n. 31 forsán p. p., specim. in mus. Fenn. ad **B. laurocerasi* Vain. pertinens]. *Lecidea* Nyl. Fl. 1872 p. 355. Thallus tenuis, leviter verruculis inspersus, dilute cinereo-glauescens aut sordide albicans, hypothallo indistincto. Apothecia sparsa, mediocria, lat. 0.8—0.3 mm, modice elevata, crass. circ. 0.280 mm, basi constricta, atra, haud pruinosa, disco plano aut demum depresso-convexo, opaco, margine sat tenui, leviter prominente, nitido, demum interdum excluso. Perithecium in margine subpurpureo-rufescens (KHO distinctius purpureum) aut extus partim pallidum, inferne vulgo pallidum, chondroideum, ex hyphis formatum radiantibus, pachydermaticis, tubulis oblongis, 0.0005—0.001 mm latis. Hypothecium albidum aut pallidum et partim superne ad marginem rufescens (ibique KHO purpureum), chondroideum. Hymenium superius cyanescenti-nigricans aut partim subolivaceo-caerulescens, KHO subolivaceum aut aeruginosum. Hymenium 0.080—0.070 mm crassum, jodo persistenter caerulescens. Paraphyses apicibus leviter incrassatis. Sporae rectae, „aciculares, pauci-septulatae, long. 0.060—0.045, crass. 0.003—0.0025 mm“ (teste Nyl. l. c.). — Ad corticem Alni prope Göthlunda in Nericia in Suecia (O. G. Blomberg). — Forsán est variatio *B. endoleucae* Vain., reactione epithecii et statura apotheciorum sicut in *B. subacerina* ab ea differens.

Obs. 3. *B. biatorina* (Koerb.) Vain. *Rhaphiospora atosanguinea* „*biatorina* Koerb. Par. Lich. 3 Lief. (1861) p. 238. *Bacidia acerina* Zwackh Lich. Exs. (1859) 336 A („*B. affinis* Zwackh olim p. p.“), Lich. Heidelb. (Fl. 1862) p. 23, Arn. Fl. 1862 p. 391, Lich. Exs. (1863) n. 232. *Secoliga acerina* Stizenb. l. c. (1863) p. 60 p. p. (excl. specim. Pers.). *Lecidea acerina* Zwackh Lich. Heidelb. (1883) p. 50 (excl. cit. p. p.), Lojka Lich. Univ. (1885) p. 34. Thallus crassus aut sat crassus, verruculis supra hypothallum album aut impure albidum dispersis aut contiguus, minutis granuliformibusque, p. p. demum in isidia subcylindrica torulosave, ramulosa, pallido-albescentia, KHO non reagentia, brevia, 0.160—0.090 mm crassa excrecentibus. Apothecia mediocria, lat. 0.5—1 mm, sparsa, elevata, saepe substipitata, stipite hypothallo substratoque immerso, cum stipite 0.340—0.540 mm alta, rufa aut testaceo-rufescentia aut nigricantia, haud pruinosa, disco plano, opaco, margine mediocri, disco concolore aut pallidiore, prominente aut demum discum haud superante, vulgo nitido. Perithecium rarius pallidum, vulgo extus aut superne totum violascens, intus dilutius coloratum aut subpallidum, basi decoloratum (KHO partes violascentes pulchrius violascentes), chondroideum, ex hyphis formatum radiantibus, conglutinatis, pachyder-

maticis, sat crebre septatis, cavitatibus cellularum 0.0005 mm latis aut in margine 0.002—0.0025 mm latis. Hypothecium superne impure aut partim dilute pallescens, plectenparenchymaticum, cellulis in seriebus irregularibus, cavitatibus rotundatis aut saepius depressis, 0.0015—0.002 mm latis, membranis sat tenuibus, inferne decoloratum, irregulariter chondroideum, tubulis tenuibus, membranis incrassatis. Hymenium 0.085—0.120 mm crassum, jodo caerulescens, ascis dein vinose tinctis. Epithecium in apotheciis obscurioribus partim tenuiter subviolascens, partim pallidum aut subdecoloratum, partibus intensius coloratis KHO distinctius violascentibus. Paraphyses laxae cohaerentes, crass. 0.001—0.0015 mm, simplices. Sporae (ex Nyl. in herb.) aciculares, rectiusculae, apicibus acutis, pluri-septatae, long. 0.060—0.050, crass. 0.004—0.003 mm. — Thallo isidioso optime distinguitur a *B. fusciorubella* et **B. laurocerasi*. Ad corticem Quercus et Abietis prope Heidelberg (Zwackh v. Holzhausen) et Eichstätt (Arnold) in Germania et prope Ober-Uster (Zürich) in Helvetia (C. Hegetschweiler).

15. *B. arceutina* (Ach.) Arn.

Fl. 1871 p. 53; Th. Fr. Lich. Scand. II (1874) p. 352 (excl. v.); Lindau Lich. Unters. I (1895) p. 23. *Lecidea luteola* γ. *L. arceutina* Ach. Meth. Lich. (1803) p. 61, Lich. Univ. (1810) p. 197; Nyl. Prodr. Nov.-Gran. Lich. ed. 2 (1864) p. 63. *Secoliga arceutina* Stizenb. Krit. Lecid. Nadelf. Sp. (1863) p. 30 (excl. v.). *B. arceutina* α. *genuina* Branth et Rostr. Lich. Dan. (1869) p. 107. *Lecidea arceutina* Nyl. in Norrl. Bidr. Sydöstr. Tav. Fl. (1870) p. 189 (excl. v.); Vain. Lich. Vib. (1878) p. 64; Nyl. Lich. Paris (1896) p. 84. *Lecidea effusa* Hepp Syst. Samml. (1852) n. 223 (haud *Verrucaria effusa* Hoffm. Deutschl. Fl. Cr., 1796, p. 174). *Biatora effusa* Hepp Flecht. Eur. (1853) n. 24. *Lecidea luteola* v. *fuscella* Nyl. Herb. Lich. Paris. (1855) n. 135. *L. luteola* v. *fuscescens* E. Nyl. Lafveg. Sav. (1857) p. 74. *L. luteola* v. *endoleuca* Nyl. Not. Faun. Fl. Fenn. IV (1858) p. 98.

Exs. Hepp Syst. Samml. XVII (1852) n. 223, Flecht. Eur. I (1853) n. 24. — Nyl. Herb. Lich. Paris. III (1855) p. 135. — Zwackh Lich. Exs. (1859) n. 372 A, B. — Rabenh. Lich. Eur. XIX (1861) n. 523. — Anzi Lich. Rar. Venet. (1863) n. 57. — Th. Fr. Lich. Exs. Scand. III (1865) n. 66. — Arn. Lich. Exs. (1866) n. 326 a, (1876) b, Lich. Monac. (1893) n. 311. — Malme Lich. Suec. Exs. II (1897) n. 32, XXVI (1917) n. 639.

Thallus tenuis aut sat tenuis, leviter verruculoso-inaequalis, cinereo-glauescens aut rarius albidus. Apothecia sat parva, fusca aut rarius nigricantia vel cinereo-fuscescentia, haud pruinosa, late adnata, basi parum aut leviter constricta, disco vulgo depresso-convexo, margine

vulgo subconcolore, tenui aut sat tenui, vulgo demum excluso. Hypothecium superne pallidum aut dilute rubricoso-rufescens, KHO non reagens aut leviter subviolaceum. Perithecium in margine extus vulgo subviolaceo-rufescens, KHO violaceum. Hymenium sat crassum. Epithecium sordide subviolaceo-fuscescens, KHO violaceum. Paraphyses simplices. Sporae aciculares, sat longae, gracillimae, rectae aut leviter contortae, pluri-septatae.

Var. *hypochroa* Vain. *L. luteola* γ. *L. arceutina* Ach. Meth. Lich. (1803) p. 61.

Hypothecium superne pallidum, KHO haud aut leviter reagens.

Distr. Ad corticem Sorbi, Populi, Betulae, Alni, Abietis in provinciis meridionalibus. N.: Kyrkslätt (A. Kullhem, Vain.), Helsingforsia (J. P. Norrlin, F. Elfving, Vain.). Ka.: Vanhaviipuri Viburgi (Vain.). Ta.: Kuivajärvi, Saukonieni, Jokioinen in Tammela (A. Kullhem).

In specimine orig. Acharii in Suecia lecto apothecia crass. circ. 0.240 mm. Hypothecium superne sordide fulvo-lutescens vel subpallidum, inferne decoloratum, KHO non reagens, strato chondroideo irregulariter contexto, crasso. Perithecium ex hyphis radiantibus, pachydermaticis formatum, tubulis tenuibus, oblongis elongatisve, in margine extus sordide violascens, KHO violaceum. Hymenium 0.070—0.060 mm crassum, jodo obscure vinose rubens. Epithecium sordide subviolaceo-fuscescens, KHO purpureum. Paraphyses arcte cohaerentes, crass. 0.001 mm, apice leviter incrassatae. Sporae aciculares, leviter contortae aut rectae, long. 0.046—0.050, crass. 0.0015 mm. — In specimine ad Viburgum lecto hypothecium etiam inferne medio plectenparenchymaticum. — Observante Nyl. (n. 17888 in herb. suo) conidia filiformia, bene curvata, long. 0.016—0.020, crass. 0.0005 mm.

Var. *endophaeotera* Vain.

Hypothecium superne rubricoso-rufescens aut dilute fuscescens vel rubricoso-pallidum, KHO rubricosum.

Distr. Ad corticem Sorbi, Populi, Salicis capreae, Betulae, Juniperi, Abietis et ad lignum in provinciis meridionalibus. Ab.: Skräbböle in Pargas (F. Elfving). N.: Kyrkslätt (A. Kullhem). Ka.: Vanhaviipuri Viburgi (Vain.). Kol.: Nikola (F. Elfving). Ta.: Särkijärvi, Pähkijärvi, Saukonieni, Letku in Tammela (A. Kullhem), Tiirismaa in Holola (Vain.).

Variatio parum est constans, saepe in var. *hypochroam* transiens. — Hypothallus indistinctus aut tenuissimus nigricansque. Apothecia

vulgo sat crebra, lat. vulgo 0.5—0.6 (0.3—0.8) mm, crass. 0.200—0.320 mm. Hypothecium superne subplectenparenchymaticum, cellulis in seriebus verticalibus aut raro subhorizontalibus (in specimine ad Viburgum lecto), cavitatibus rotundatis aut interdum depressis, 0.0015—0.002 (—0.003) mm latis, membranis modice incrassatis, inferne decoloratum, chondroideum, pachydermaticum, irregulariter contextum. Perithecium in margine saepe subplectenparenchymaticum, cavitatibus oblongis, 0.002—0.0015 mm latis aut in parte exteriori subellipsoideis, membranis modice incrassatis, intus decoloratum aut pallidum, inferne decoloratum chondroideumque, tubulis tenuioribus longioribusque, simplicibus aut partim ramoso-connexis, membranis incrassatis. Hymenium 0.065—0.080 (—0.090) mm crassum, jodo intense caerulescens deindeque vinose rubens, raro persistenter caerulescens. Paraphyses arcte cohaerentes, apice haud aut leviter incrassatae, simplices. Sporae aciculares, rectae aut leviter contortae, apicem inferiorem versus sensim attenuatae, long. 0.040—0.074, crass. 0.0015 mm („—0.0025 mm“, observante Nyl.), septis 3—7 (secund. Hepp), vulgo parum conspicuis. Gonidia pleurococcoidea, vulgo simplicia.

Obs. *Bacidia arceutina* f. *deminuta* Th. Fr. (Lich. Scand. II, 1874, p. 353), lecta ad Tammela Tavastiae (A. Kullhem), apotheciis describitur parvis (0.2—0.4 mm lat.), subpellucide rufescentibus, planis vel concavis, marginatis, hypothecio luteo-fuscidulo, paraphysibus decoloratis. Colore hypothecii proxima est v. *endophaeoterae*. — *L. arceutina*, peltigericola, ad Valkeamäki in Karelia Onegensi (Norrl. Fl. Kar. Oneg. II, 1876, p. 31) et in Hollola Tavastiae austr. (Nyl. Fl. 1874 p. 14) a Norrl. lecta, ad *Bacidiam peltigericolam*, *Bacidiae muscorum* (Sw.) affinem, pertinet.

16. *B. rubella* (Ehrh.) Mass.

Ric. Lich. Crost. (1852) p. 118; Koerb. Syst. Lich. Germ. (1855) p. 186, Parerg. Lich. 2 Lief. (1860) p. 131 (excl. var. γ .); Th. Fr. Lich. Aret. (1860) p. 179, Lich. Scand. II (1874) p. 344; Branth et Rostr. Lich. Dan. (1869) p. 106; Arn. Lich. Fragm. XI (Fl. 1871) p. 56, Lich. Fränk. Jur. (1884) p. 182; Lindau Lich. Unters. I (1895) p. 22. *Lichen rubellus* Ehrh. Pl. Crypt. XX (1791) n. 196 (Arn. Lich. Fragm. XXIII p. 552, XXVII p. 405). *Lecidea rubella* Schaer. Lich. Helv. Spic. (1833) p. 168; Vain. Étud. Lich. Brés. II (1890) p. 10. *Secoliga* Stizenb. Krit. Bem. Lecid. Nadelf. Sp. (1863) p. 47. *Lichen corticalis* Rutstr. Spic. Crypt. Suec. (1794) p. 7. *Lichen luteolus* Schrad. Syst. Samml. Crypt. (1794) n. 85; Ach. Lich. Suec. Prodr. (1798) p. 42; Wahlenb. Fl. Suec. (1826) p. 832. *Lecidea luteola* Ach. Meth. Lich. (1803) p. 60 (α .), Lich. Univ. (1810) p. 95 p. p., Syn. Lich. (1814) p. 41 (excl. β .); Sommerf. Suppl. Fl. Lapp. (1826) p. 164; Nyl. Lich. Scand. (1861) p. 209 (α .), Prodr. Nov.-Gran. Lich. ed. 2 (1864) p. 63, Lich. Paris (1896) p. 82. *Biatora vernalis* α . *luteola* Fr. Lich. Eur. Ref. (1831) p. 260.

Thallus tenuis aut modice incrassatus aut raro crassus, vulgo subverrucosus, saepe albidus aut subpallescens. Apothecia vulgo mediocria, rarius majuscula aut parva, vulgo carneopallida aut subluteo-rubella, rarius pallida aut testacea vel testaceo-rufescentia aut sanguineo-rubricosa, disco plano aut rarius demum convexo, haud pruinoso, margine crassiusculo aut mediocri, vulgo prominente, persistente aut rarius demum excluso, disco concolore nudoque aut rarius pruinoso. Hypothecium superne vulgo pallidum, KHO non reagens. Hymenium vulgo crassum. Epithecium decoloratum aut pallidum, KHO non reagens. Perithecium pallidum aut decoloratum. Sporae aciculares, longae, sat crassae, pluri-septatae.

Var. *luteola* (Schrad.) Vain. l. c. p. 11. *Lichen luteolus* Schrad. Spic. Fl. Germ. (1794) p. 85. *Bacidia rubella* α. *luteola* Th. Fr. Lich. Scand. II (1874) p. 345. *B. rubella* α. *vulgaris* Koerb. Parerg. Lich. 2 Lief. (1860) p. 131. *Secoliga rubella* f. *ochrocarpa* Stizenb. l. c. (1863) p. 52. *Bacidia rubella* f. *ochrocarpa* Arn. Lich. Fragm. XI (1871) p. 56.

Exs. Moug. Stirp. Vog. VII (1820) n. 641. — Fr. Lich. Suec. Exs. VII (1826) n. 197 (Th. Fr. l. c.). — Flot. Lich. Exs. III (1829) n. 222 A, B (Arn. Lich. Fränk. Jur. p. 182). — Desmaz. Crypt. Fr. ed. 1 XII (1832) n. 572, ed. 2 XXIII n. 1128. — Schaer. Lich. Helv. Exs. IX (1833) n. 210. — Hepp Syst. Samml. XVIII (1852) n. 232 (sec. sequ.), Flecht. Eur. (1853) n. 141 (in herb. meo). — Zwackh Lich. Exs. (1854) n. 232 p. p. (sec. Stizenb. l. c.). — Nyl. Herb. Lich. Par. II (1855) n. 55. — Rabenh. Flecht. Eur. II (1855) n. 31. — Stenh. Lich. Suec. Exs. n. 53 inf. (sec. Arn.). — Arn. Lich. Monac. (1895) n. 408. — Malmé Lich. Suec. Exs. IX (1911) n. 218.

Thallus tenuis aut modice incrassatus. Apothecia carneopallida aut subluteorubella aut rarius pallida, margine haud pruinoso.

Distr. Ad corticem Ulmi, Quercus, Populi tremulae, Sorbi, Betulae, Coryli, Alni, Juniperi rara in Fennia, praesertim locis subapricis crescens. Al.: Ramsholm in par. Jomala et Idö in par. Kökar (E. Nylander). Ab.: Runsala (P. A. Karsten, A. Kullhem, F. Elfving), Vihti (E. Nylander), Paavola in Isosaari in Lohja (C. E. Boldt). N.: Kyrkslätt (A. Kullhem). IK.: Makkara in Sakkola (V. Räsänen). Ka.: Vasikka-saari in Koivisto (E. Nylander). KLad.: Valamo (J. J. Chydenius). Sat.: Siikainen (A. J. Malmgren). Ta.: Hersala et Tiirismaa in Hollola (Vain.), Kaila in Asikkala (F. Silén, J. P. Norrlin). KOL.: Humbaritsa (F. Elfving).

Thallus verrucosus aut verruculosus, verruculis 0.5—0.05 mm latis, verrucis depressis adnatisque aut adscendentibus et fere squamaeformibus aut subsidioideis, dispersis aut contiguis, interdum evanescens, vulgo sordide albidus, saepe subfulvo-pallescent, sat opacus, KHO non reagens, sorediis destitutus, hypothallo albo, tenui, crebre contexto, inter verrucas thalli conspicuo continuoque aut indistincto. Apothecia crebra aut sparsa, sessilia, adpressa aut cūpulari-elevata, basi bene constricta, lat. 1.7—0.3, vulgo 1—0.7 mm, crass. 0.340—0.285 mm. Perithecium chondroideum, ex hyphis formatum radiantibus, sat pachydermaticis, conglutinatis, cavitatibus cellularum oblongis, 0.0015—0.002 (—0.005) mm latis, aut superficiem versus ellipsoideis, pallidum aut inferne decoloratum aut in margine intus fulvescens (et KHO intense fulvescens, in specimine e Valamo), aut dilute subviolascens-roseum (KHO parum reagens, in specimine ex Humberitsa) aut partim testaceo-rufescens (KHO non reagens, in specim. e Vihti). Hypothecium superne plectenparenchymaticum, cavitatibus cellularum rotundatis, 0.002 mm latis, in seriebus verticalibus dispositis, partim etiam depressis et in seriebus horizontalibus dispositis, membranis modice incrassatis, pallidum aut pallido-fulvescens (KHO intense fulvescens, in spec. e Valamo) aut materiam roseam parvisime continens (KHO non reagens, in spec. ex Humberitsa) aut maculatim testaceo-rufescens (his maculis KHO non reagentibus, in spec. e Vihti), inferne chondroideum, ex hyphis irregulariter contextis, sat pachydermaticis, conglutinatis formatum, cavitatibus oblongis, pallidum aut albidum, jodo haud caerulescens, sed vinose rubens (sicut etiam thallus). Hymenium 0.070—0.120 (—0.060) mm crassum, totum pallidum (aut epithecio maculatim testaceo-rufescente, KHO non reagente (in spec. e Vihti), jodo persistenter caerulescens (in spec. e Ramsholm, Vihti et Valamo) aut demum obscure vinose rubens (in spec. ex Humberitsa). Paraphyses sat laxae (in KHO laxae) cohaerentes, simplices aut partim furcatae, septatae, crass. 0.001 mm, apice parum aut leviter incrassatae (0.0015 mm). Sporae 8-nae, polystichae, aciculares, altero apice obtuso, altero sensim attenuato, rectae aut subrectae, septis 6—13 (aut pluribus, ut nonnulli auct. indicant), long. 0.031—0.070, crass. 0.002—0.0035 mm, secundum Hepp long. 0.023—0.067 mm, observante Nyl. long. —0.002, crass. —0.005 mm. Conidia filiformia, curvata aut undulata secundum Mudd, Mon. Brit. Lich. p. 182. Gonidia pleurococcoidea, simplicia diam. 0.006—0.020, interdum glomerulosa, etiam 2—3-cellulosa visa, membrana tenui.

Var. *fuscopurpurascens* (Harm.) Vain. *Lecidea luteola* v. *fuscopurpurascens* Harm. Cat. Lich. Lorraine V p. 378.

Exs. Stenh. Lich. Suec. Exs. n. 53 sup. p. p.ⁿ („n. 53 a, apoth. p. p. sanguinea“ secund. Arn. Lich. Fränk. Jur. p. 182, Lich. Fragm. XI p. 56).

Thallus tenuis aut modice incrassatus. Apothecia sanguineo-rubrescentia, haud pruinosa.

Distr. Ad corticem Quercus in Ramsholm in Jomala in Al. (F. Elfving). Ad corticem vetustum in Kyrkslätt in N. (A. Kullhem). Ad corticem Populi in Klimskij in KOn. (Th. Simming).

Thallus verrucis adnatis aut squamaeformi-adscendentibus. Apothecia crebra aut sparsa, disco plano aut demum depresso-convexo, margine concolore, haud aut interdum primum prominente. Perithecium in lamina tenui pallidum, KHO non reagens. Hypothecium superne pallidum aut dilute pallido-rubricosum (KHO non reagens), inferne decoloratum. Hymenium 0.110—0.120 mm crassum, totum dilutissime pallidum aut decoloratum, KHO non reagens, jodo persistenter caerulescens aut partim demum vinose rubens. Sporae aciculares, septis 7—18, long. 0.045—0.067, crass. 0.002—0.004 mm.

Var. pachythallina Vain.

Thallus crassus, subcoralloides. Apothecia haud pruinosa, disco rufescente testaceove.

Distr. Supra muscos destructos (*Anomodon longifolius*, verisimiliter in rupe) ad Perttiniemi in Karelia Onegensi (Th. Simming).

Thallus circ. 2—1 mm crassus, e verrucis constans subsquamaeformibus, adscendentibus, confertis et subcoralloideo-connatis ramosisque, pallescens aut albidoglauescens. Apothecia simplicia aut tuberculoso-ramosa confluentiave, margine pallido aut raro rufescente, persistente, crassiusculo aut excluso (rarissime etiam pruinoso, quare haec variatio in var. *porriginosam* transit).

Var. porriginosa (Turn.) Vain. *Lichen porriginosus* Turn. in Trans. Linn. Soc. VIII (1807) p. 94 (orig. in herb. Ach.). *Lecidea luteola* γ. *porriginosa* Ach. Lich. Univ. (1810) p. 196; Nyl. Lich. Scand. (1861) p. 209, Lich. Armor. (1863) p. 412. *Secoliga rubella* f. *porriginosa* Stizenb. l. c. (1863) p. 50. *Bacidia rubella* β. *porriginosa* Th. Fr. Lich. Scand. II (1874) p. 345; Arn. Lich. Fränk. Jur. (1884) p. 182. *B. fraxinea* Lönnr. Fl. 1858 p. 612. *B. rubella* **coronata* Koerb. Parerg. Lich. 2 Lief. (1860) p. 131. *B. rubella* var. *lecanorina* (Hepp in litt., Arn.) Krempelh. Lich. Bay. (1861) p. 225; Arn. Lich. Fragm. XI (1871) p. 56. *B. rubella* var. *albomarginata* (Caldesi) Rabenh. Lich. Eur. XXI (1861) n. 581.

Exs. Flot. Lich. Exs. (1829) n. 222 C (sec. Arn. Lich. Fränk. Jur. p. 182). — Zwackh Lich. Exs. (1854) n. 232 p. p. (sec. Stizenb. l. c.). — Rabenh. Lich. Eur. XXI (1861) n. 581. — Stenh. Lich. Suec. Exs. n. 53 B p. p. (sec. Arn. l. c.). — Malme Lich. Suec. Exs. XXVII (1917) n. 661.

Thallus sat tenuis aut modice incrassatus aut raro tenuis. Apothecia disco testaceo aut rufescente aut raro pallescente, margine pruinoso aut nudo in eodem specimine.

Distr. Ad corticem Ulmi in Tölö prope Helsingforsiam (Vain.).

Est variatio valde inconstans. — Thallus sicut in v. *luteola* variabilis, verrucis et verruculis adnatis, depressis aut adscendentibus, pallidis aut albidis aut cinereo-glauescentibus. Apothecia crebra aut sparsa, lat. 2—0.3 mm, disco plano aut demum convexo, opaco, nudo, margine sat crasso aut mediocri, saepe prominente, interdum demum flexuoso, persistente aut rarius demum excluso, pruina subalbida, tenui, valde inconstante. Perithecium chondroideum, hyphis pachydermaticis, cavitatibus angustis, in margine pallidum aut dilute rufescenti-pallidum. Hypothecium superne pallidum aut dilute rufescenti-pallidum. Hymenium circ. 0.080 mm crassum, totum dilute pallidum, jodo persistenter caerulescens. Sporae apicibus obtusis aut altero apice sensim attenuato, pluri-septatae (septas 9 vidi), long. 0.044—0.064, crass. 0.003 mm.

Obs. Secundum variationes thalli et apotheciorum var. *luteola* in formas plures habitu dissimiles, at valde inconstantes, dividi potest. Inter eas notetur f. *chlorotica* (Ach.) Vain. (*Lecidea luteola* ð. *chlorotica* Ach. Lich. Univ., 1810, p. 196), apotheciis testaceis a v. *luteola* (in sensu strictiore) vel f. *ochrocarpa* (Stizenb.) differens. Ad corticem sorbi in Tiirismaa in Hollola Tavastiae merid. legi. In hoc specimine thallus albus, parum evolutus, sporae long. 0.048—0.058, crass. 0.002 mm, circ. 6-septatae. In specimine orig. n. 300 (ad ramulos crescente) ex Helvetia in herb. Ach. thallus verruculosus, verruculis granuliformibus, pallido-albescentibus, apotheciis 0.6—0.3 mm latis, testaceis, margine tenui, demum excluso, hymenio 0.090—0.120 mm crasso, jodo persistenter caerulescente, perithecio chondroideo, sporis long. circ. 0.050, crass. 0.0025 mm. N. 284 (item ex Helvetia, at ad corticem trunci arboris crescens), eodem nomine in herb. Ach. denominatus, non est specimen orig. et ad *B. albescentem* pertinet. F. *chlorotica* Vain. vix nisi notis internis a *B. albescente* v. *intermedia* (Hepp) distingui potest.

Ser. 2. *Hymenium modice incrassatum aut tenue* (crass. circ. 0.060—0.035 mm).

17. *B. inundata* (Fr.) Koerb.

Syst. Lich. Germ. (1855) p. 187; Arn. Lich. Fragm. XI (1871) p. 54, Lich. Fränk. Jur. (1884) p. 185, Zur Lich. Münch. (1892) p. 19; Th. Fr. Lich. Scand. II (1874) p. 350. *Biatora* Fr. Vet. Ak. Handl. (1822) p. 270. *Lecidea* Nyl. in Norrl. Ber. Torn. Lappm. (1873) p. 337; Nyl. Fl. 1875 p. 106; Hue Addend. II (1888) p. 166; Vain. Adj. Lich. Lapp. II (1883) p. 15. *Biatora luteola* v. *inundata* Fr. Syst. Veg. Scand. (1846) p. 112. *Bacidia Arnoldiana* ß. *inundata* Koerb. Parerg. Lich. 2 Lief. (1860) p. 135. *Lecidea luteola* var. *inundata* Nyl. Lich. Scand. (1861) p. 209 (Énum.

Gén. Lich., 1857, p. 122). *Secoliga inundata* Stizenb. Krit. Lecid. Nadelf. Sp. (1863) p. 33 (p. p.). *L. arceutina* **L. inundata* Nyl. in Norrl. Bidr. Sydöstr. Tav. Fl. (1870) p. 189. *L. luteola* v. *arceutina* Nyl. Lich. Lapp. Or. (1866) p. 154. *Biatora Tulasnei* Hepp Syst. Samml. XVII (1852) p. 229.

Exs. Hepp Syst. Samml. (1852) n. 229, Flecht. Eur. II (1857) n. 289 p. p. — Koerb. Lich. Select. Germ. (1857) n. 163 (teste Stizenb. l. c.). — Fellm. Lich. Arct. (1864) n. 174. — Zwackh Lich. Exs. (1881) n. 653 A, B, C. — Lojka Lich. Regn. Hung. Exs. II (1882) n. 62, III n. 138. — Arn. Lich. Monac. Exs. (1891) n. 182, (1896) n. 441. — Malme Lich. Suec. Exs. VI (1909) n. 140, XXV (1916) n. 620, XXIX (1918) n. 705. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 716, 717.

Thallus sat tenuis aut crassus, vulgo verruculoso-inaequalis, vulgo cinereo-virescens aut sordide albido-glauescens. Apothecia minuta, sessilia, basi bene constricta, adnata, disco vulgo persistenter plano, rarius demum convexo, carneo- vel testaceo-pallido aut rufescente fuscescenteve aut nigricante, nudo, opaco, margine concolore aut pallidiore, sat tenui aut rarius tenui, vulgo persistente. Hymenium sat tenue, decoloratum aut praesertim superne sordide coloratum vel dilute subfuscescens vel violaceo-fuscescens, KHO non aut leviter reagens. Hypothecium parte superiore sublutescens fulvescensve aut decoloratum aut dilute fuscescens subpurpureumve, totum plectenparenchymaticum. Perithecium plectenparenchymaticum. Sporae aciculares, sat longae, sat rectae, vulgo pauci-septatae, vulgo gracillimae.

Distr. Ad saxa et ligna et rarius ad corticem Alni, Pruni padi et Salicis phylicifoliae in littoribus rivulorum lacuumque, raro etiam supra muscos et ad basim saxi in prato, in provinciis meridionalibus mediisque passim suisque regionibus sat frequenter obveniens. In Fennia boreali et Lapponia Kuollaënsi sat rara.

Thallus continuus aut rimoso-diffractus, verruculis minutis aut granuliformibus, sparsis aut contiguis, raro rufescenti- aut olivaceo-glauescens, hypothallo indistincto aut raro albido. Apothecia sat crebra aut sparsa, lat. vulgo 0.4—0.3, rarius 0.6—0.2 mm, crass. circ. 0.200—0.160 mm, raro mox convexa, margine prominente aut demisso, interdum obscuriore, quam discus. Hypothecium plectenparenchymaticum, in parte superiore seriebus cellu-

larum subhorizontalibus aut sat irregularibus, cavitatibus depressis aut rotundatis, 0.0015—0.003 mm latis, membranibus sat tenuibus, in parte inferiore irregulariter plectenparenchymaticum, cavitatibus 0.003—0.010 mm latis, membranibus sat tenuibus, decoloratum, parte superiore interdum subrubricoso-pallidum, KHO dilute violascens aut non reagens. Perithecium in margine sordide purpureum fuscescensve aut rufescens (HNO₃ rubricosum) aut totum pallidum decoloratumve, KHO non reagens, plectenparenchymaticum, ex hyphis radiantibus formatum, cavitatibus cellularum in eodem apothecio rotundatis, ellipsoideis et oblongis, 0.0015—0.006 mm latis, membranibus sat tenuibus. Hymenium jodo sat dilute caerulescens deindeque vinose rubens, circ. 0.050—0.060 (0.040—0.065) mm crassum, parte superiore (interdum inferiore) fusciscente aut pallida aut rarius subcynescensve olivascenteve, aut totum decoloratum, KHO non reagens, partibus obscuratis HNO₃ rubricosis. Paraphyses arcte aut sat arcte cohaerentes, simplices aut raro furcatae, crass. 0.0015—0.001 mm, apice 0.003—0.004 mm aut parum incrassatae, sat parce evolutae, apice crebre, ceterum minus crebre septatae. Sporae 8:nae, aciculares, alterum apicem versus vulgo sensim attenuatae, aut raro subbacillares, rectae aut leviter curvatae, septis nullis aut vulgo 3 aut raro pluribus (—7 teste Stizenb. l. c., —11 secundum Hepp l. c. n. 289), long. 0.020—0.043 (—0.050 mm, secund. Nyl. in herb. suo), crass. 0.001—0.002 mm (raro —0.0035 mm, secund. Nyl.). Conidangia lat. 0.150—0.160 mm, conceptaculo fusco aut subpurpureo (sub microscopio). Conidia filiformia, bene curvata, „long. 0.030, crass. 0.0006 mm“ sec. Nyl. in Suppl. Lich. Paris (1897) p. 6, sec. annot. Nyl. in herb. suo in „*L. inundata*“ long. 0.020—0.035, crass. 0.0005—0.0006 mm (macroconidia?), in „*L. subinundata*“ Nyl. long. 0.012—0.018, crass. 0.0005 — vix 0.001 mm (microconidia?). Gonidia pleurococcoidea, globosa, simplicia diam. 0.006—0.012 (0.020) mm, saepe etiam 2—4-cellulosa, membrana incrassata aut sat tenui. — Formae hujus speciei valde inconstantes sunt, saepe in eodem specimine transeuntes.

F. laevigata Vain. Adj. Lich. Lapp. II (1883) p. 15.

Thallus tenuis, minus verruculosus. Apothecia in eodem specimine versicoloria.

Distr. Ad saxa, ligna et cortices. N.: Tali prope Helsingforsiam (J. P. Norrlin, „*L. subinundata*“, conidiis 0.014—0.016 mm longis secund. annot. in n. 17656 in herb. Nyl.). Ta.: Mustiala, Haarakorpi, Letku in Tammela (A. Kullhem), Asikkala (Norrl.), Tammijoki in Luhanka (Vain.). Sa.: Savonlinna (O. Carlenius, con. 0.020—0.025 mm longis: 17670 in herb. Nyl.). KOL.: Petrosavodsk (Th. Simming, con. 0.020—0.032 mm longis:

17666 in herb. Nyl.). Tb.: Norola in Jyväskylä (Vain.). OKaj.: Prope Templum in Kianta (Vain.). Kuus.: Mäntyjoki (Vain.). Llm.: Kantalahti (N. I. Fellman, n. 17680 in herb. Nyl.).

F. abbreviata Vain. l. c.

Thallus tenuissimis, laevigatus. Apothecia carneopallida. Sporae breviores, long. 0.022—0.028, crass. 0.002 mm, pauci-septatae.

Distr. Ad basim Salicis in rivulo prope Veskonieni in regione pinifera Lapponiae Inarensis (Vain.).

F. lacustris (Fr.) Vain. l. c. *Biatora fuscolutea* δ . *lacustris* Fr. Vet. Ak. Handl. 1822 p. 270 (Th. Fr. l. c. p. 351).

Thallus tenuis, leviter verruculoso-inaequalis. Apothecia nigricantia aut fusconigra. Sporae long. 0.030—0.040, crass. 0.002 mm.

Distr. Ad saxa, ligna et cortices vetustos Alni. Ta.: Kuivajärvi in Tammela (A. Kullhem), ad Putula in Koski, Asikkala (J. P. Norrlin). KOL.: Petrosavodsk (Norrl., conidiis „0.020—0.025 mm longis, 0.0005 mm crassis“: 17660, 17787 in herb. Nyl.). Tb.: Jyväskylä (Vain.). OKaj.: Kiannanniemi et Templum (Vain.). LTul.: Kuolla (Fellm. Lich. Arct. n. 174).

F. prunicola Vain.

Thallus tenuis, verruculoso-inaequalis. Apothecia minora, lat. 0.2—0.3 mm, pallida vel sordide testacea aut rarius sordide rufescentia, disco plano, margine saepe prominente. Sporae aciculares, long. 0.025—0.032, crass. 0.0015 mm. Hymenium crass. 0.050 mm, decoloratum aut epithecio dilute subviolascente. Hypothecium totum plectenparenchymaticum. Perithecium plectenparenchymaticum.

Ad corticem Pruni padi prope Herala in Hollola in Ta. (Vain.).

F. granulifera Vain. l. c. — Norrl. et Nyl. Herb. Lich. Fenn. cont. n. 716, 717.

Thallus crassus aut modice incrassatus, verruculoso-inaequalis. Apothecia versicoloria, subcarneopallida testaceave aut partim obscurata.

Ad saxa et ligna et cortices Salicis. Ab.: Jurmo (E. Nylander). N.: Vanhakaupunki (Vain.), Tali prope Helsingforsiam (Nyl., Vain.). Ka.: Viburgum (Vain.). KOL.: Petrosavodsk (J. P. Norrlin, „*L. subinundata*“, conidiis 0.014—0.018 mm longis: 17659 in herb. Nyl.). Ta.: Locis numerosis in Tammela (A. Kullhem), Messilä in Hollola (Norrl.), Asikkala (Norrl., 17793, et „*L. subinundata*“: 17654 in herb. Nyl.), Vesijärvi (Norrl., 17653 in herb. Nyl.), Tuomisoja (Vain.) in Asikkala, Kivistö in Padasjoki (Vain.), Jutinsalo et Kotkanlahti in Luhanka (Vain.). Tb.: Jyväskylä (K. Linkola, Vain.: 17665 in herb. Nyl.). Sb.: Rytty (Pirttilä), Haminanlahti (Myllyjoki) prope Kuopio (K. Linkola). Kb.:

Pag. Lieksa, Nevala in par. Lieksa, Lipinlahti in Nurmes (Vain.). OKaj.: Ahola, Kettula in Kianta (Vain.). KKER.: Knjäsä (P. A. Karsten).

F. sublacustris Vain. l. c. p. 16.

Thallus crassus, verruculoso-inaequalis. Apothecia nigricantia.

Ad saxa littoralia et in pratis sita, ligna. N.: Tali prope Helsingforsiam (Vain.). Ta.: Mustiala, Letku, Haarankorpi in Tammela (A. Kullhem). Sb.: Myllyjoki in Haminanlahti prope Kuopio (K. Linkola). OKaj.: Kettula in Kianta (Vain.). Kuus.: Poussu in regione abietina (Vain.). KKER.: Knjäsä (N. I. Fellman). LTul.: Prope Sinum Kuollaënsem (Fellm.).

F. dissulta Vain. l. c. p. 15.

Thallus crassus, sat laevigatus. Apothecia versicoloria.

In saxis litteralibus in Fennia bor. (Vain. l. c.). OKaj.: Jalaskoski in Kianta (F. Silén, „*L. subinundata*“, con. 0.012—0.015 mm longis, 0.0005 — vix 0.001 mm crassis: 17657, 17658 in herb. Nyl.). LKem.: Muonio in Muonioniska (J. P. Norrlin).

Obs. *L. subinundata* Nyl. (Fl. 1875 p. 106, Norrl. Fl. Kar. Oneg. II, 1876, p. 31, Hue Addend. II, 1888, p. 166), conidiis duplo brevioribus (long. „0.012—0.018“, crass. „0.0005 — vix 0.001“ mm) distincta, locis sequentibus collecta est: Tali prope Helsingforsiam (videas sub f. *laevigata* Vain.), Petrosavodsk, Asikkala (f. *granulifera* Vain.), Jalaskoski in Kianta (f. *dissulta* Vain.). Aliis notis externis internisve a „*L. inundata*“ Nyl. non differt. Macroconidiis et microconidiis in eodem specimine adhuc non est visa, sed parasitis conidia efferentibus saepe instructa est. Talia in Vain. Adj. Lich. Lapp. II p. 15 et 16 describuntur. In specimine orig. e Tali (n. 17656 in herb. Nyl.) hymenium 0.050—0.065 mm crassum, maculis sordide rubricosis instructum, ceterum decoloratum, jodo sat dilute caerulescens deindeque vinose rubens. Hypothecium plectenparenchymaticum, inferne decoloratum aut pallidum, superne sordide pallidum aut dilutissime subrufescenti-pallidum, nec KHO nec HNO₃ reagens. Perithecium plectenparenchymaticum, cavitatibus cellularum globosis aut ellipsoideis, 0.002—0.003 mm latis, membranis leviter incrassatis, partim sordide purpureum, KHO distinctius purpureum. Paraphyses parce evolutae, arcte cohaerentes, simplices, septatae, crass. 0.001 mm, apice parum incrassatae aut crass. 0.003—0.004 mm. Sporae aciculares, 3-septatae, long. 0.020—0.040, crass. 0.0015—0.002 mm, observante Nyl. long. 0.032—0.042, crass. 0.002—0.003 mm (in specimine in Dalslandia Sueciae a Hulting lecto 3—5-septatae teste Nyl.).

18. *B. tenella* Kullh.

Kullh. Not. Sällsk. p. F. et Fl. Fenn. Förh. XI (1871) p. 273. *Lecidea tenella* Nyl. Fl. 1881 p. 185. *Bacidia egenula* Th. Fr. Lich. Scand. II (1874) p. 363 p. p. (conf. infra). *Lecidea egenula* Nyl. Fl. 1872 p. 355 p. p. (in Fl. 1865 p. 147 ad diversam speciem pertinet).

Thallus tenuis aut crassus, irregulariter diffractus dispersusve, inaequalis, verruculosus aut verruculoso-granulosus, sordide vel glaucescenti-cinereus. Apothecia minutissima, tenuia, late adnata, plana aut raro leviter convexa, nigra aut fusconigra, margine tenuissimo, demum saepe inconspicuo. Hymenium tenue, superne interrupte sordide violascens, KHO non reagens. Hypothecium dilute lutescens, plectenparenchymaticum. Perithecium plectenparenchymaticum, sordide violascens, KHO non reagens. Sporae aciculares, longitudine mediocres, gracillimae, septis inconspicuis.

Distr. Ad lignum pineum in pariete vetusto in Riiska prope Mustialam in Ta. (A. Kullhem), una cum *Lecan. cerinella* Floerk.

Affinis sit *B. inundatae*, at species autonoma. — Thallus leprosus, opacus, hypothallo indistincto. Apothecia lat. 0.150—0.220 mm, crass. circ. 0.060 mm, nuda, opaca, margine parum conspicuo, disco concolore. Hymenium 0.030—0.035 mm crassum, „jodo vinose rubens, praecedente fugacissima levissimaque caerulescentia, KHO vel HNO₃ vix mutatur“ (secund. Th. Fr. l. c.). Hypothecium KHO non reagens, membranis leviter incrassatis, cavitatibus cellularum 0.0015—0.004 mm latis, rotundatis aut ellipsoideis, in parte superiore subhorizontaliter, ceterum irregulariter dispositis. Perithecium ex hyphis radiantibus, conglutinatis formatum, membranis leviter aut modice incrassatis, cavitatibus cellularum rotundatis, 0.0015 mm latis, HNO₃ non reagens. Paraphyses arcte cohaerentes, simplices, tubulis tenuissimis, membranis gelatinosis. „Sporae vulgo rectae, apicibus acutis aut altero apice obtuso, septis inconspicuis, long. 0.024—0.039, crass. 0.001—0.0015 mm“ (secund. Kullh. et Nyl. in herb. suis). Gonidia pleurococcoidea, vulgo simplicia, diam. 0.008—0.012 mm, parce 2-cellulosa et glomerulosa.

Obs. *Lecidea egenula* Nyl., Fl. 1865 p. 147, Lich. Paris (1896) p. 85, Vain. Lich. Exp. Vegae Pitlek. (1909) p. 105, supra saxa arenaria

sylvae Fontainebleau in Gallia a Nyl. lecta, thallo instructa minute verruculoso, evanescente, hypothecio (centro) luteo-fuscescente vel subrufescente, epithecio subincolore aut passim cyanescente, perithecio caerulescenti-nigricante, „acido nitrico violacee tincto“. Specimina alia in Gallia (Lamy Catal. 107), Germania (Zwackh Lich. Exs. n. 654), Hibernia (Larbal.), Islandia (Groenlund) hoc nomine salutata, huc non pertinent (secundum specimina orig. in herb. Nyl.).

19. *B. albescens* (Hepp) Zwackh

Fl. 1862 p. 495; Th. Fr. Lich. Scand. II (1874) p. 348 p. p.; Arn. Lich. Fränk. Jur. (1884) p. 186 p. p. *Scoliciosporum atosanguineum* f. *albescens* (Hepp in litt.) Arn. Fl. 1858 p. 475. *Secoliga arceutina* var. *β. albescens* Stizenb. Krit. Lecid. Nadelf. Sp. (1863) p. 43. *Lecidea albescens* Vain. Adj. Lich. Lapp. II (1883) p. 14. *L. luteola* var. *chlorotica* Nyl. Lich. Lapp. Or. (1866) p. 153 (Nyl. Fl. 1865 p. 147, haud Ach., conf. sub *B. rubella*, p. 185). *L. chlorotica* Nyl. Lich. Paris (1896) p. 84. *Bacidia intermedia* var. *chlorotica* Arn. Lich. Fragm. XI (1871) p. 54. *B. phacodes* Koerb. Parerg. Lich. 2 Lief. (1860) p. 130.

Exs. Zwackh Lich. Exs. n. 339 B, (1859) n. 340 A, B, C, (1884) n. 941, (1886) n. 979, (1888) n. 1048. — Arn. Lich. Exs. (1860) n. 96 a, (1879) n. 96 b, (1883) n. 1049, (1886) n. 1174 p. p., (1894) 1661. — Lojka Lich. Regn. Hung. Exs. III (1882) n. 137, Lichen. Univ. III (1886) n. 138. — Arn. Lich. Monac. Exs. (1894) n. 382. — Malme Lich. Suec. Exs. II (1897) n. 34.

Thallus tenuis aut raro (in Zwackh l. c. n. 1048) modice incrassatus, verruculoso-inaequalis, cinereo-glauescens aut albidus. Apothecia parva aut minutissima, adnata, basi sat bene constricta, disco primum planiusculo, demum aut vulgo fere mox depresso-convexo aut bene convexo, vulgo carneo-pallido, saepe etiam pallidoalbido aut carneoluteolo aut raro cinereo-albido vel cinereo-pallescente, haud pruinoso, margine tenuissimo aut tenui, subconcolore, demum aut vulgo fere mox excluso. Hymenium sat tenue, epithecio decolorato aut pallido. Hypothecium decoloratum aut pallidum. Perithecium decoloratum. Sporae aciculares, sat longae, gracillimae, leviter flexuosae aut rectae, septis paucis.

Var. **phacodes** (Koerb.) Vain. *Bacidia phacodes* Koerb. l. c. — Exs. supra citata.

Apothecia minora, vulgo convexa immarginataque, carneopallida aut pallido- vel raro cinereo-albida, margine tenuissimo, demum aut vulgo fere mox excluso.

Distr. Ad corticem Sorbi, Salicis capreae, Alni, Pruni padi, Betulae, Juniperi, ad lignum truncorum, ad Polyporum et Ribem grossulariam emortuam et raro ad rupem crescit. Ab.: Hannula in Askainen (K. Linkola). N.: By-Martis in Sibbo (Vain.). Ta.: Mustiala et Pähkijärvi in Tammela (A. Kullhem), Herala (Vain.), Tiirismaa (Vain.), Hersala (Norrl., Vain.) in Hollola, Asikkala (Norrl.), Padasjoki (Vain.), Evois in Lammi (Norrl.), Onkisalo in Luhanka (Vain.), Tianen in Korpi-lahti (Vain.). KOn.: Mökkö in Suojärvi (Norrl.). KJer.: Ruankoski (N. I. Fellman, n. 17807 in herb. Nyl.), Knjäsä (Fellm.).

Hypothallus indistinctus. Apothecia vulgo crebra, lat. 0.2—0.3 (—0.4) mm, crass. 0.180—0.240 mm. Hypothecium superne decoloratum aut pallidum (aut in sectione crassiore fulvenscens et KHO distinctius fulvenscens), subplectenparenchymaticum, cavitatibus cellularum partim depressis et tunc 0.0015—0.002 mm latis, partim in seriebus horizontalibus, ceterum irregulariter dispositis, membranis modice incrassatis, inferne decoloratum, pachydermaticum, cavitatibus rotundatis — oblongis, 0.004—0.0015 mm latis, at varians partim chondroideum cavitatibusque longioribus. Perithecium plectenparenchymaticum, ex hyphis radiantibus, conglutinatis formatum, cavitatibus cellularum subglobosis aut ellipsoideis, long. 0.005—0.007, lat. 0.003—0.005 mm, membranis modice aut partim sat bene incrassatis, tenuioribus in parte exteriori perithecii. Hymenium 0.035—0.050 mm crassum, decoloratum aut totum pallidum aut epithecio pallido, jodo caerulescens deindeque vinose rubens. Paraphyses arcte aut sat arcte cohaerentes, simplices, in crebre septatae, crass. 0.001—0.0015 mm, apice capitatae clavatae et 0.002—0.003 mm crassae. Sporae aciculares, rectae aut flexuosae, altero apice sensim attenuato, septis 3 aut paucis, saepe simplices (—15-septatae, observante Stizenb. l. c. p. 44), long. 0.020—0.033 (secundum annot. in herb. Nyl. —0.040) mm, crass. 0.001—0.0015 (ex annot. Nyl. —0.003) mm. Gonidia globosa, diam. 0.008—0.017 mm, simplicia aut 2—4-cellulosa, membrana saepe sat crassa, pleurococcoidea.

Obs. *Lecidea luteola* δ . *chlorotica* Ach. (Lich. Univ., 1810, p. 196) ad *B. albescentem* (Arn.) non pertinet, secund. specim. orig. n. 300 ex Helvetia in herb. Ach. jam hymenio 0.090—0.120 mm crasso et sporis 0.050 mm longis et 0.0025 mm crassis ab ea differens (videas sub *B. rubella*, p. 185).

Var. *carneoluteola* (Nyl.) Vain. *Lecidea inundata* f. *carneoluteola* Nyl. Fl. 1867 p. 178.

Apothecia minora, vulgo convexa immarginataque, testaceo-carnea, margine tenuissimo, demum aut vulgo fere mox excluso.

Distr. Ad Polyporum et Hydnum vetustum, ad lignum et corticem truncorum vetustorum arborum locis siccioribus minusque umbris, quam var. *phacodes*, crescit. N.: Mäkiinpäällys Hoglandiae

(M. Brenner). Ta.: Mustiala (A. Kullhem), Koski (J. P. Norrlin), Papinsaari (Vain.) in Hollola. OKaj.: Paltamo (F. Silén). KKER.: Ruankoski (N. I. Fellman, n. 17804 in herb. Nyl.).

In specimine orig. thallus tenuissimus, laevigatus, continuus, sordide albidus aut albedo-glauescens, hypothallo indistincto. Apothecia lat. 0.2—0.35 (0.15—0.4) mm, crebra aut conferta, intensius colorata, quam in var. *phacode*. „Sporae aciculares, subrectae, long. 0.030—0.038, crass. 0.001 mm, septis nullis, epithecium et hypothecium incoloria“ (Nyl. l. c.), HNO_3 haud reagentia. Sporas 1—2-septatas vidi. Paraphyses simplices, increbre septatae, crass. 0.0015 mm, apice clavatae et 0.003 mm crassae. Variatio parum est constans, saepe in v. *phacodem* transiens. Secundum annotationem Nylandri in sched. (n. 17646) conidia filiformia, recta, long. 0.025, crass. 0.0005 mm.

20. *B. intermedia* (Hepp) Arn.

Lich. Fragm. XI (Fl. 1871) p. 54 (excl. var.), Lich. Exs. (1886) n. 1174. *Secoliga arceutina* f. *intermedia* (Hepp in litt.) Stizenb. Krit. Lecid. Nadelf. Sp. (1863) p. 42. *Lecidea luteola* var. *intermedia* Nyl. Lich. Lapp. Or. (1866) p. 184. *L. chlorotica* **L. intermedia* Nyl. in Norrl. Fl. Kar. Oneg. II (1876) p. 31. *Bacidia albescens* f. *intermedia* Arn. Lich. Fränk. Jur. (Fl. 1884) p. 186. *L. chlorotica* v. *intermedia* Nyl. Lich. Paris (1896) p. 84. *Bacidia effusa* Rabenh. Lich. Eur. XVIII (1860) n. 509. *Bacidia rubella* ? *assulata* Koerb. Parerg. Lich. 2 Lief. (1860) p. 131 p. p. (ex Stizenb. l. c.). *Bacidia phacodes* Rabenh. l. c. XIX (1861) n. 547. *Biatora arceutinoides* Anzi Lich. Langob. Exs. XI (1865) n. 434 (Stizenb. Lec. sabul. p. 7).

Exs. Zwackh Lich. Exs. (1859) n. 370 (secundum Zwackh l. c. n. 584), (1880) n. 584, (1886) n. 980. — Rabenh. Lich. Eur. XVIII (1860) n. 509, XIX (1861) n. 547. — Arn. Lich. Exs. (1863) n. 231, (1886) n. 1174 p. p. — Anzi Lich. Langob. Exs. XI (1865) n. 434.

Apothecia vulgo majora, pallida aut rarius testaceo-pallida, disco persistenter plano aut demum depresso aut raro bene convexo, margine sat tenui aut rarius tenui, persistente aut demum excluso.

Distr. Ad corticem Salicis capreae et Sorbi et ad lignum vetustum. N.: Hoglandia (atypica, M. Brenner). Ta.: Mustiala (A. Kullhem), Tiirismaa in Hollola (Vain.). KOn.: Perttiniemi (A. Kullhem, unum tantum adest apothecium, a Nyl. examinatum, sporis „long. 0.055—0.065, crass. 0.002 mm“).

In specimine typico (in Rabenh. Lich. Eur. n. 509), ad corticem Fagi prope Constantiam in Germania a Stizenb. lecto, thallus modice incrassatus, verruculis minutissimis granuliformibus crebre inspersus, cinereo-glauescens. Apothecia sparsa aut sat crebra, lat. 0.5—0.3 mm, crass. 0.260—0.200 mm, subcarneo-pallida, disco persistenter plano aut demum depresso-convexo, margine sat tenui (crassiore, quam in v. *phacode*), persistente aut demum excluso, disco vulgo concolore. Hypothecium superne pallido-lutescens aut intense carneo-pallidum vel fere testaceum, KHO non reagens, subplectenparenchymaticum, cavitatibus cellularum depressis, 0.002—0.0015 mm latis, in seriebus horizontalibus dispositis, membranibus modice incrassatis, inferne subdecoloratum, chondroideum, pachydermaticum, tubulis elongatis, 0.0005—0.001 mm latis, irregulariter dispositis. Perithecium chondroideum, ex hyphis radiantibus, conglutinatis formatum, cavitatibus cellularum elongatis aut oblongis, tenuibus, membranibus modice aut bene incrassatis, pallidum aut pallido-lutescens, inferne decoloratum, KHO non reagens, aut partim in superficie marginis cavitatibus globosis, 0.003 mm latis, membranibus modice incrassatis. Hymenium 0.060—0.050 mm crassum, totum decoloratum aut partim pallidum, jodo intense caerulescens deindeque vinose rubens. Paraphyses sat arcte cohaerentes, simplices, apice levissime aut parum incrassatae. Sporae aciculares, rectae, alterum apicem versus sensim attenuatae, altero apice obtuso aut acuto, septis 3 aut raro pluribus, aut simplices, long. 0.034—0.048 (in specimine ex Hoglandia teste Nyl. „—0.062“, ex Anglia „0.027“), crass. 0.0015—0.002 („—0.0025“) mm. Conidia filiformia, bene arcuata, long. 0.012—0.018 (teste Nyl. in n. 17855) aut 0.016—0.022 (teste Nyl. in n. 17836, ab eo in „*L. chloroticam*“ relato), crass. 0.0005 mm. Gonidia pleurococcoidea. — Notis externis et internis a *B. albescente* differt, at saepe in eam transire videtur. A *L. rubella* sporis tenuioribus, apotheciis minoribus et verruculis thalli subtilioribus distinguitur.

Obs. *Lecidea tarandina* Nyl. [Sert. Lich. Labuan (1891) p. 44] supra cornu vetustum in Gellivaara in Lapponia Suecica lecta, gonidiis a *Trentepohlia iolitho* praeditis, cellulis globosis, pachydermaticis, raro concatenatis, diam. 0.036—0.024 (—0.012) mm, ceterum est *B. albescenti* (Arn.) simillima (sporas non vidi). Gonidia hanc speciem ad *Gyalectas* pertinere indicant.

21. *B. hemipolia* (Nyl.) Vain.

Lecidea arceutina f. *hemipolia* Nyl. Fl. 1869 p. 413; Norrl. Bidr. Sydöstr. Tav. Fl. (1870) p. 189; Hue Addend. II (1888) p. 165.

Bacidia arceutina f. *hemipolia* Th. Fr. Lich. Scand. II (1874) p. 353. *L. arceutina* **hemipolia* Nyl. Fl. 1873 p. 294; Norrl. Fl. Kar. Oneg. II (1876) p. 31. *L. hemipolia* Nyl. Lich. Paris (1896) p. 84 (conf. p. 196).

Thallus tenuis aut tenuissimus, leviter verruculoso-inaequalis aut sat laevigatus, albidus. Apothecia parva, sessilia, basi bene constricta, mox bene convexa, semiglobosa aut depresso-subglobosa, disco subdimidiatim vel majore minoreve parte fuscescente nigricanteve, ceterum pallido testaceove, raro toto nigro pallidove, immarginata. Hymenium sat tenue, epithecio vulgo partim aeruginoso et partim decolorato, KHO non reagente. Hypothecium decoloratum aut pallidum. Sporae aciculares, sat longae, rectae, septis paucis, gracillimae.

Distr. Ad corticem Alni, Ulmi et Populi rara. Ta.: Manskivi (J. P. Norrlin) et Messilä (Vain.) in Hollola, Mustiala (A. Kullhem) in Tammela. KOn.: Perttiniemi (Norrl.).

Hypothallus indistinctus. Apothecia crebra, lat. 0.4—0.3 (—0.6) mm, crass. circ. 0.360—0.300 mm, interdum livida aut nonnulla tota pallida, ad truncos erectos crescentia partibus acumen arboris spectantibus vulgo obscuratis. Hypothecium superne albidum aut pallidum, KHO leviter lutescens aut fulvescens, subplectenparenchymaticum, cellulis irregulariter dispositis, cavitatibus rotundatis, 0.0015—0.002 mm latis, membranis modice incrassatis, inferne decoloratum, pachydermaticum, cavitatibus mixtim rotundatis, ellipsoideis et oblongis, 0.0015—0.003 mm latis, subchondroideum. Perithecium tantum infra apothecia evolutum, tenue, chondroideum, ex hyphis radiantibus, conglutinatis formatum, cavitatibus tenuissimis, oblongis, membranis modice incrassatis, extus pallescens. Hymenium 0.045—0.050 mm crassum, jodo leviter caerulescens, dein vinose rubens. Paraphyses arcte cohaerentes, simplices, septatae, tubulis 0.0005—0.001 mm crassis, apice leviter incrassatae, saepe 0.0015 mm, raro 0.003 mm crass., apicem versus partim sordide rufescentes aut in eodem apothecio aeruginosae, partim decoloratae, KHO non reagentes aut colore dilutescente aut distinctius aeruginoso. Sporae aciculares, rectae aut leviter contortae, alterum apicem versus sensim attenuatae, pauci-septatae aut simplices, long. 0.024—0.031 (in specim. orig.), crass. 0.001—0.0015 mm. Pycnidia verrucas formantia hemisphaerica, 0.110—0.080 mm lata, aeruginoso-nigricantes (in lamina tenui). Stylospora ellipsoideae, apicibus

rotundatis, decolores, simplices, long. 0.003—0.002, crass. 0.0015 mm. Gonidia pleurococcoidea, globosa, diam. 0.006—0.016 mm, simplicia aut 2—4-cellulosa aut glomerulosa. — Etiam in Anglia a J. M. Crombie lecta est (n. 17971 in herb. Nyl.). Planta nomine „*L. hemipoliae*“ in Nyl. Lich. Paris p. 84 citata, ad Versalias lecta, ad *B. arceutinam* var. *hypochroam* Vain. pertinet (epithecium rufescens, KHO violascens secund. specim. n. 17973 in herb. Nyl.).

22. *B. Friesiana* (Hepp) Korb.

Parerg. Lich. 2 Lief. (1860) p. 133; Arn. Lich. Fränk. Jur. (Fl. 1884) p. 185; Th. Fr. Lich. Scand. II (1874) p. 357. *Biatora Friesiana* Hepp Flecht. Eur. II (1857) n. 288 (haud *Lecidea Friesii* Ach.). *Secoliga Friesiana* Stizenb. Krit. Lecid. Nadelf. Sp. (1863) p. 30. *Bacidia coerulea* Korb. Lich. Sel. Germ. VI (1857) n. 162, Parerg. Lich. 2 Lief. (1860) p. 134 (haud *L. coerulea* Krempelh. Fl. 1857 p. 372). *Lecidea luteola* var. *coerulea* Nyl. Lich. Lapp. Or. (1866) p. 184. *Biatora Friesiana* var. *coerulea* Hepp Flecht. Eur. IV (1867) n. 746 a. *Lecidea Norrlini* Lamy Cat. Lich. Mont-Dore (1880) p. 107.

Exs. Zwackh Lich. Exs. (1851) n. 88 a, bis, (1858) n. 278 A, B (secund. Arn. l. c.). — Hepp Flecht. Eur. II (1857) n. 288, IV (1867) n. 746 a, b. — Korb. Lich. Sel. Germ. VI (1857) n. 162 (secund. Arn. l. c.). — Rabenh. Lich. Eur. XIX (1861) n. 524 a, b, XX (1861) n. 557. — Arn. Lich. Exs. (1861) n. 168. — Jack, Leiner, Stizenb. Bad. Cr. n. 519 a—c (secund. Arn. l. c.). — Oliv. Herb. Lich. de l'Orne II (1880) n. 88, VIII 382 (secund. Arn. l. c.). — Roumegu. Lich. Gall. Exs. IV (1882) n. 392 (secund. Arn. l. c.). — Lojka Lich. Univ. I (1885) n. 36. — Malme Lich. Suec. Exs. II (1897) n. 33, XIX (1915) n. 463.

Thallus vulgo modice incrassatus, verruculosus, cinereo-glauescens cinerascensve aut sordide albidus. Apothecia parva aut rarius mediocria, nigricantia aut fusciscentia aut livida vel caerulescenti-livida aut raro livido-pallescentia, saepe eodem disco versicolore, haud pruinosa, late adnata, basi parum constricta, disco plano aut vulgo demum convexo, margine tenui aut vulgo tenuissimo, persistente aut vulgo demum excluso. Hypothecium decoloratum aut pallidum aut raro superne subrubricosum-pallidum. Hymenium sat tenue, parte superiore subaeruginosum subnigricansve aut rarius subviolascens, KHO haud aut rarius vage varieque reagens. Perithecium varie coloratum. Paraphyses

simplices. Sporae aciculares, longitudine mediocres, rectae aut leviter contortae, pauci- aut pluri-septatae.

Var. *Norrlini* (Lamy) Vain. *Biatora Friesiana* Hepp Flecht. Eur. II (1857) n. 288.

Exs. Hepp Flecht. Eur. II (1857) n. 288. — Zwackh Lich. Exs. (1858) n. 278 (secund. Arn. l. c.). — Rabenh. Lich. Eur. XX (1861) n. 557. — Arn. Lich. Exs. (1861) n. 168. — Jack, Leiner, Stizenb. Bad. Cr. n. 519 a—c (sec. Arn. l. c.). — Roumegu. Lich. Gall. Exs. IV (1882) n. 392 (sec. Arn. l. c.).

Thallus sorediis destitutus. Apothecia disco fuscescente aut nigricante, diu plano aut depresso-convexo, margine saepe diu persistente, demum excluso, disco concolore aut saepe obscuriore. Hypothecium albidum pallidumve. Hymenium superius sordide subaeruginosum subnigricansve aut sordide subviolaceum. Perithecium in margine sordide violaceum aut pallidum, KHO non reagens.

Distr. Ad truncum putridum alni in Hersala in par. Hollola Tavastiae austr. inter apothecia subsp. **B. Hollolensis* Vain. — Thallus verruculosus, hypothallo indistincto. Apothecia parva, lat. 0.5—0.3 mm. Epithecium sordide aeruginosum (et KHO distinctius aeruginosum) aut subnigricans aut sordide subviolascens (et KHO non reagens). Hypothecium pallidum. Perithecium in margine subviolaceum, KHO non reagens. Sporae aciculares, leviter contortae aut rectae, long. circ. 0.030, crass. 0.001—0.0015 mm. — In specimine orig. (Hepp Flecht. Eur. n. 288) apothecia crass. 0.230 mm. Hymenium 0.060—0.065 mm crassum, jodo intense caerulescens deindeque obscure subvinose fuscescens. Hymenium superius aeruginoso-fuligineum et in eodem apothecio partim olivaceopallidum, KHO non reagens aut dilutius coloratum vel subolivaceum. Hypothecium decoloratum aut superne dilute pallidum. Perithecium in margine aut extus fuscescens vel dilute rufescens, plectenparenchymatico-chondroideum, cavitatibus oblongis, 0.003—0.002 mm latis, ex hyphis radiantibus, sat pachydermatis, conglutinatis formatum. Paraphyses simplices, arcte cohaerentes, septatae, tubulis 0.001 mm crassis, apice crass. 0.0015 mm. Sporae aciculares, altero apice obtuso, altero attenuato, rectae, septis 3—7 (—16 secund. Hepp l. c.), long. 0.032—0.045 (secund. Hepp l. c. 0.036—0.064), crass. 0.002 mm (—0.003 mm secund. Nyl. in herb. suo). — „*Lecidea luteola* var. *caerulea* (Korb., *L. dryina* Dub., *Friesiana* Stzb.)“, in Nyl. Lich. Lapp. Or. (1866) p. 184 allata (thallo calcicolae adnascens alieno prope Tiudie Kareliae Ouegensis a Th. Simming socia *Lecanorae vitellinae* v. *aureellae* collecta), sec. specim. orig. n. 17668 in herb. Nyl. potius ad var. *Norrlini* Vain., quam ad *B. inundatam* aut *B. Arnoldianam* pertinet. Thallus indistinctus. Apothecia lat. 0.5—0.35 mm, crass. 0.260 mm, disco fusco aut fusco-nigricante, plano, opaco, margine tenui, fusco aut nigricante, opaco. Peri-

thecium in margine extus pulchre aut dilute purpureum, intus dilute coloratum aut fere decoloratum, inferne decoloratum, chondroideum, tubulis angustis, oblongis et in parte inferiore elongatis. Hypothecium superne pallidum aut decoloratum, irregulariter subplectenparenchymaticum, cavitatibus 0.0015—0.002 mm latis, saepe depressis, inferne decoloratum, medio plectenparenchymaticum, lateribus chondroideis, ex hyphis ramoso-connexis formatis. Hymenium 0.050—0.060 mm crassum, parte superiore dilutissime aeruginosum et partim decoloratum. Paraphyses apice subcapitato-incrassatae (0.005—0.003 mm crassae). Sporae aciculares, rectae, pauci-septatae, long. 0.028, crass. 0.0015 mm, observante Nyl. „long. 0.034—0.046, crass. 0.002 mm, septulis indistinctis“.

Var. leprarioides Vain.

Thallus partim sorediosus. Apothecia disco fusco-nigricante nigricanteve aut parcius fuscescente, convexo aut rarius plano, margine concolore vulgo excluso. Hypothecium albidum pallidumve aut vulgo superne subrubricosum-pallidum. Hymenium superius partim dilutissime sordide subaeruginosum. Perithecium in margine violaceo-rubricosum.

Distr. Ad corticem Juniperi in Mustiala in Ta. specimen bonum ab A. Kullhem collectum.

B. affini (Zwackh) habitu subsimilis, ab ejus var. *subrufescente* (Nyl.) praesertim hypothecio thallogue differens. Est forma intermedia inter var. *Norrtini* Vain. et **B. Hollolensem* Vain. Thallus verruculosus, verruculis contiguus aut dispersis, cinerascens aut cinereo-glauescens, sat tenuis aut modice incrassatus, in parte 80 mm lata sorediis omnino destitutus, at in alia parte sorediosus, soraliis sordide stramineis aut cinereo-glauescentibus, parvis dispersisque aut late confluentibus, sorediis farinosis tenuissimisque, hypothallo indistincto. Apothecia numerosa, crebra aut partim sparsa, lat. 0.8—0.2 mm, late adnata, basi parum constricta, crass. 0.130—0.220 mm. Hymenium 0.050—0.052 mm crassum, jodo vinose rubens, primum dilute caerulescens. Hymenium superius dilute subaeruginosum (KHO parum reagens) aut partim decoloratum, partim etiam sordide subviolascens. Hypothecium superne dilute rubricosum-pallidum (KHO distinctius subviolascens) aut pallidum, cavitatibus cellularum subhorizontalibus, inferne anguste pallidum aut subdecoloratum. Perithecium plectenparenchymato-chondroideum, cavitatibus vulgo oblongis, angustis aut in parte inferiore modice dilatatis, membranarum modice incrassatis aut sat crassis, dilute violaceo-rubricosum, etiam infra hypothecium coloratum, in margine intense subviolaceum rufescens, KHO parum reagens. Paraphyses arcte cohaerentes. Sporae aciculares aut subbacillares, alterum apicem versus leviter attenuatae, rectae aut leviter flexuosae, septis vulgo 6, long. 0.030—0.036, crass. 0.0015—0.002 mm, observante Kullh. „long. 0.024—0.037 mm“.

Obs. Var. *coerulea* (Koerb.) Vain. (*Bacidia coerulea* Koerb. l. c.) secund. Hepp l. c. n. 746 a disco livido-nigricante aut subcaerulescenti-livido et margine (in lamina tenui) pallido aut saepe partim sordide aeruginoso a var. *Norrlini* differt et non sit autonoma species. Apothecia lat. 0.3—0.8 mm, numquam pruinosa, vulgo mox depresso-convexa margineque excluso, late adnata, basi parum constricta, interdum uno latere carneo-pallescente (et apotheciis *B. hemipoliae* Nyl. subsimilia). Hymenium 0.015—0.060 mm crassum. Epithecium saltem partim sordide aeruginosum, KHO non reagens aut dilutescens (in Rabenh. l. c. n. 524 a KHO dilute sordideque subviolascens). Hypothecium pallidum aut decoloratum. Perithecium plectenparenchymaticum, cavitatibus rotundatis aut ellipsoideis, 0.005—0.0015 mm latis, membranis modice incrassatis. Paraphyses simplices, crass. 0.001 mm, apice subaeruginoso-capitato et 0.005—0.002 mm crasso (apice haud incrassato aut 0.002 mm crasso in Rabenh. l. c.). Sporae aciculares, rectae aut leviter contortae, 4—7-septatae, long. 0.022—0.038, crass. 0.0015—0.002 mm (in Rabenh. l. c.), „long. 0.028—0.044, crass. 0.002—0.003 mm, 3-septatae“ observante Nyl. in specim. ad Heidelbergam lecto. — Huc pertinent Hepp Lich. Helv. IV (1867) n. 746 a, Rabenh. Lich. Eur. XIX (1861) n. 524 a, b, Lojka Lich. Univ. (1885) n. 36, Malme Lich. Suec. Exs. II (1897) n. 33, XIX (1915) n. 463 et teste Arn. l. c. Zwackh Lich. Exs. (1851) n. 88 a, bis, Koerb. Lich. Sel. Germ. VI (1857) n. 162, Oliv. Herb. Lich. de l'Orne n. 88. — In Fennia nondum est lecta.

23. **B. Hollolensis* Vain. (n. subsp.).

Thallus vulgo modice incrassatus, verruculosus, sordide albidus. Apothecia parva, nigricantia aut partim fusconigra fuscave, nuda, late adnata, basi parum constricta, disco plano aut vulgo demum convexo, margine tenuissimo, vulgo demum excluso. Hypothecium croceo- vel fulvo-rubescens. Hymenium sat tenue, praesertim parte superiore dilute sordideque subaeruginosum, KHO non reagens. Perithecium in margine subrufescens, KHO purpureum. Paraphyses simplices. Sporae subaciculares, pauci-septatae, rectae aut leviter contortae.

Distr. Ad truncum putridum alni in Hersala in par. Hollola Ta. (Vain.).

Thallus partim sat crassus, partim evanescens, verruculis contiguus aut subdispersis, aut partim verruculoso-inaequalis, hypothallo indistincto. Apothecia crebra, lat. 0.5—0.2 mm, opaca. Hymenium 0.040—0.050 mm crassum, jodo caerulescens deindeque

vinose rubens. Hypothecium pulchre croceo-rubricosum aut fulvo-rubescens, KHO sordide pallido-rubricosum, plectenparenchymaticum, cavitatibus vulgo anguloso-subglobosis, 0.006—0.003 mm latis, in seriebus subhorizontalibus dispositis, membranarum leviter incrassatis. Perithecium ex hyphis radiantibus, conglutinatis, modice pachydermaticis formatum, cellulis brevibus, 0.003—0.006 mm latis, in margine extus fusco-rufescens, KHO purpureum, intus hypothecio colore consimile. Paraphyses simplices, parcae, arcte cohaerentes, tubulo crass. 0.001 mm, apice haud incrassatae, gelatinosae. Sporae 8-nae, 3—4-septatae, apicibus ambobus acutis aut altero apice obtuso et altero attenuato, long. 0.028—0.031, crass. 0.001—0.0015 mm. Gonidia simplicia aut glomerulosa, pleurococcoidea. — Habitu similis est *Bacidiae Hegetschweileri* et *Buelliae myriocarpae* (D.C.).

24. *B. minuscula* Anzi

Catal. Lich. Sondr. (1860) p. 70, Lich. Langob. Exs. IV (1861) n. 147. *Secoliga Beckhausii* Stizenb. Krit. Lecid. Nadelf. Sp. (1863) p. 21 (conf. p. 202). *Bacidia Beckhausii* Th. Fr. Lich. Scand. Exs. III (1865) n. 67, Lich. Scand. II (1874) p. 359; Malme Lich. Suec. Exs. IV (1908) n. 91, VII (1910) n. 167. *Lecidea stenospora* Nyl. Fl. 1869 p. 413 (conf. p. 202), Lich. Par. (1896) p. 86; Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 318; Vain. Adj. Lich. Lapp. II (1882) p. 21.

Thallus tenuis aut tenuissimus, verrucoso- aut raro verruculoso-inaequalis, albidus aut cinerascens, aut saepe evanescens. Apothecia parva aut minutissima, sat late adnata aut adpressa, basi leviter constricta, disco vulgo convexo aut raro diu vel persistenter plano, sublivido-nigricante aut nigro aut rarius caesiolivido, nudo aut rarius pruinoso, opaco, margine tenuissimo, mox excluso aut raro persistente, disco vulgo subconcolore. Hypothecium decoloratum aut pallido-lutescens. Hymenium sat tenue, parte superiore lividum vel sordide subviolascens subfuscescensve aut aeruginosum aut raro partim subdecoloratum, KHO semper violascens. Perithecium in margine sordide subviolascens aut rubricosus-fuscescens rufescensve aut raro partim subdecoloratum, KHO violascens. Sporae bacillares, breves, 3-septatae, subrectae.

(Var. *obscurior* Vain.: *Bacidia Beckhausii* a. *obscurior* Th. Fr. Lich. Scand. II (1874) p. 360 (emend.). *Bacidia minuscula* Anzi l. c. *Secoliga Beckhausii* f. *minuscula* Stizenb. l. c. p. 22.

Exs. Anzi Lich. Langob. Exs. IV (1861) n. 147. — Arn. Lich. Exs. (1871) n. 462. — Th. Fr. Lich. Scand. Exs. III (1865) n. 67. — Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 318. — Arn. Lich. Monac. (1895) n. 410. — Malme Lich. Suec. Exs. IV (1908) n. 91.

Apothecia nigra aut livido-nigricantia, nuda, vulgo convexa, margine tenuissimo, vulgo mox excluso. Hymenium superius lividum vel sordide subviolaceum subfuscescensve.

Ad corticem Sorbi, Salicis capreae, Alni, rarius Populi, Coryli, Pruni padi, Juniperi, S. pentandrae, Quercus et ad lignum truncorum vetustorum crescit, passim in provinciis meridionalibus mediisque Fenniae, in Karelia Onegensi (Norrl.) et adhuc in Ostrobotnia Kajanaensi (Vain.) proveniens. In regione abietina montis Näränkäväära et in regione Coniferarum mixtarum ad Mäntyjoki in Kuus. (Vain.). KKer.: Inter Suvijärvi et Knjäsä (N. I. Fellman). Ob.: Ad Alkkula et Turtola (Norrl.). LEont.: Ad Hetta in Enontekiäinen (Norrl.).

Hypothallus indistinctus. Apothecia lat. 0.15—0.5 mm, crass. circ. 0.200 mm, sat crebra aut sparsa, interdum demum tuberculato-divisa, haud pruinosa, disco mox convexo, nigro aut livido-nigricante aut rarius livido, margine tenuissimo, nigricante aut livido aut subalbido, mox aut demum excluso. Hypothecium superne subplectenparenchymaticum, cellulis partim praesertimque ad marginem in seriebus subhorizontalibus aut irregulariter dispositis, cavitatibus rotundatis aut depressis, 0.0015—0.005 mm latis, membranis leviter incrassatis, pallidum sublutescensve aut decoloratum, KHO interdum partim dilutissime violascens, inferne sat anguste chondroideum, decoloratum, hyphis ramosis pachydermaticis, conglutinatis, irregulariter contextis, in parte superiore sensim in stratum subplectenparenchymaticum transiens. Perithecium chondroideum, hyphis radiantibus, modice pachydermaticis, conglutinatis, tubulis 0.0015—0.002 mm crassis, in margine vulgo subviolascenti-rufescens, KHO violascens, inferne vulgo decoloratum. Hymenium circ. 0.040—0.050 mm crassum, jodo caerulescens deindeque vinose rubens. Hymenium superius vulgo lividum vel sat dilute sordide subviolascens aut raro subfuscescens, KHO pulchre violascens. Paraphyses sat arcte cohaerentes, simplices, apice haud aut parum incrassatae, tubulis 0.001 mm crassis, membranis gelatinosis. Sporae bacillares, apicibus obtusis, rectae aut leviter curvatae, long. 0.017—0.022 (—0.026), crass. 0.0015—0.002 (—0.003) mm, 3-septatae aut raro — 7-septatae. Stylosporae ellipsoideo-oblongae, lateribus cylindricis, apicibus rotundatis, rectae, decolores, simplices, long. 0.003, crass. 0.001 mm, numerosissimae, in conceptaculis prominentibus, atris, hemisphaericis aut basi leviter constrictis, diam. 0.090—0.120 mm, sub microscopio cya-

nescentibus. Gonidia pleurococcoidea, globosa, diam. 0.005—0.010 mm, saepe glomerulosa, membranis modice incrassatis.

Obs. 1. Ad corticem Sorbi prope Soima in Korpilahti in Ta. et ad lignum trunci prope oppidum Nurmes in Kb. specimina legi a v. *obscuriore* sporis long. 0.030—0.022, crass. 0.003—0.002 mm, 3 5-septatis recedentia (f. *longigerula* Vain.).

Obs. 2. F. *subpallens* (Nyl.) Vain. (*L. bacillifera* f. *subpallens* Nyl. Lich. Lapp. Or., 1866, p. 154 p. p., *L. stenospora* var. *subpallens* Nyl. Fl. 1869 p. 413 p. p.) apotheciis livido-fuscescentibus (p. p. nigricantibus in specim. orig.), nudis, immarginatis, 0.2—0.4 mm latis leviter a v. *obscuriore* recedit. Thallus tenuissimus, leviter inaequalis, albidus. Hymenium 0.036—0.040 mm crassum. Epithecium partim dilute sordide violascens lividumve aut partim pallido-violascens, KHO dilute violascens. Hypothecium lutescens, KHO non reagens. Perithecium in margine cinerascens, KHO violascens. Sporae long. 0.020—0.024 (Nyl. l. c.: „0.019—0.027“), crass. 0.002—0.003 mm, 3—4-septatae. Ad corticem arboris prope Ponoï in LPon. (N. I. Fellman).

Var. *planior* Vain. *L. stenospora* f. *planior* Vain. Adj. Lich. Lapp. II (1883) p. 21. *L. bacillifera* f. *spermogoniifera* Nyl. in Fellm. Lich. Arct. (1864) n. 172. *L. abbrevians* var. Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 316.

Apothecia nigra, nuda, disco plano aut demum convexo, margine tenui aut tenuissimo, persistente aut demum excluso. Hymenium superius subaeruginosum aut subcyanescens, KHO violascens.

Distr. Ad corticem Salicis capreae et Betulae obvia. Ta.: Prope Tiirismaa in Hollola (Norrl. l. c.). OKaj.: Kymälä in Kuhmo (Vain.). KKER.: Inter Susijärvi et Knjäsa (N. I. Fellman). LTul.: Kuolla (Fellm. l. c. n. 172).

Hymenium fere totum aut superne dilute sordide aeruginosum aut cyanescenti-vel aeruginoso-nigricans, KHO violascens. Sporae long. 0.015—0.022 mm („—0.028“, observante Nyl.), crass. 0.0015—0.003 mm, 3-septatae, bacillares.

Var. *Beckhausii* (Korb.) Vain. *Bacidia Beckhausii* Korb. Parerg. Lich. 2 Lief. (1860) p. 134 (conf. p. 203). *Biatora stenospora* Hepp Flecht. Eur. III (1860) n. 516. *Bacidia Beckhausii* f. *stenospora* Arn. Lich. Exs. (1874) n. 462 b. *L. umbrina* **L. poliaena* Nyl. Lich. Scand. (1861) p. 210. *Secotiga arceutina* var. *poliaena* Stizenb. Krit. Lecid. Nadelf. Sp. (1863) p. 45. *Lecidea stenospora* var. *poliaena* Nyl. Fl. 1869 p. 413. *Bacidia Beckhausii* var. *poliaena* Th. Fr. Lich. Scand. II (1874) p. 360. *Bacidia luteola* ð. *caesiopruinosa* Mudd Man. Brit. Lich. (1861) p. 183. *Lecidea caerulea* Anzi Lich. Langob. Exs. VII (1861) n. 282. *L. bacillifera* f. *subpallens* Nyl. Lich. Lapp. Or. (1866) p. 154 p. p. *L. bacillifera* f. *decolorascens* Nyl. in Th. Fr. l. c. p. 361. „*L. luteola* var.“ in Leight. Lich. Brit. Exs. V (1854) n. 150.

Exs. Leight. Lich. Brit. Exs. V (1854) n. 150. — Hepp Flecht. Eur. III (1860) n. 516. — Mudd Lich. Brit. Exs. II (1861) n. 150. — Anzi Lich. Langob. Exs. VII (1861) n. 282. — Arn. Lich. Exs. (1874) n. 462 b. — Malme Lich. Suec. Exs. VII (1910) n. 167.

Apothecia pruinosa.

Distr. Ad corticem *Salicis capreae*, *Sorbi*, *Betulae*, *Tiliae*, *Quercus*, *Pini* collecta. Ab.: Östernäs in Pargas (K. Linkola). N.: Mjölö (W. Nyl.), Stansvik in Degerö prope Helsingforsiam (K. Linkola). Ta.: Manskivi alioque loco in Asikkala, Evo in Lammi (J. P. Norrlin). Kuus.: Ruskeakallio (F. Silén, „*L. caerulea*“ secund. determ. Nylandri). Kker.: Iiava (N. I. Fellman, „f. *subpallens*“ in herb. Nyl., n. 17167, „f. *decolorascens*“ Nyl. in mus. Fenn.).

Apothecia lat. 0.2—0.6 mm (—1.2 mm in Mudd l. c. n. 150), disco plano aut vulgo mox convexo, livido aut livido-nigricante aut rarius livido-pallescente, tenuiter caesio-pruinoso, margine nigricante aut livido pallescenteve, nudo aut tenuiter pruinoso, mox vel demum excluso. *Hypothecium* superne dilute stramineum. *Hymenium* circ. 0.050 mm crassum, parte superiore dilute sordide subviolascens aut raro subolivaceum in eodem apothecio, KHO pulchre violascens. Sporae bacillares aut rarius subaciculares, apicibus obtusis aut acutis, rectae, long. circ. 0.023—0.026 (ex Hepp et Nyl. 0.020–0.032), crass. 0.0015—0.003 mm, 1—3-septatae (—7-septatae: Hepp l. c.).

Obs. 1. *F. fomentaria* (Nyl.) Vain. (*L. stenospora* var. *fomentaria* Nyl. in Norrl. Bidr. Sydöstr. Tav. Fl., 1870, p. 189), ad *Polyporum fomentarium* in Asikkala Tavastiae austr. a Norrl. lecta, ad statum intermedium inter v. *obscuriorem* et v. *Beckhausii* pertinet. *Apothecia* 0.15—0.2 mm lata, disco plano, nigricante subnudoque aut tenuissime pruinoso sublivoque, margine tenuissimo, nigricante, nudo. *Hymenium* 0.040 mm crassum, parte superiore sat dilute sordide subviolascens, KHO violascens. *Hypothecium* pallidum. *Perithecium* in margine sordide subviolascens, KHO violascens. *Paraphyses* arcte cohaerentes. *Thallus* tenuis, albidus, laevigatus, crebre areolato-diffractus, initiis apotheciorum et pycnidiis nigris crebre instructus. *Conceptaculum* in lamina tenui sordide violascens. *Basidia* brevissima. *Stylospora*e numerosissimae, ellipsoideae, lateribus rotundatis, apicibus rotundatis, long. 0.002—0.0025, lat. 0.0015 mm.

Obs. 2. *Bacidia Beckhausii* (Koerb. l. c.) est nomen antiquissimum hujus varietatis et „disco hyalino-livido nigrescenteve, caesiopruinoso“ rite descripta est, at saltem apothecia hyalino-livida epithecium „von schwach lauchgrüner Färbung“ habere non possunt, ut Koerb. erronee affert. Epithecium in hac varietate dilute sordideque obscuratum est et color ejus difficile determinatur. In *Biatora stenospora* Hepp (Flecht. Eur. n. 519 in herb. meo) apothecia sunt pruinosa, epithecio

sordide subviolaceo aut subolivaceo (KHO pulchre violascente), nec „viridulo“, ut ab Arn. enunciatur (Lich. Fragm. XI p. 58).

25. *B. invertens* Vain. (n. sp.).

Thallus tenuis, verruculoso-inaequalis, cinerascens. Apothecia parva, basi constricta, adpressa, disco atro, plano, margine tenui, fuscescente aut fusconigro, persistente. Hypothecium pallidum aut decoloratum et ad marginem dilute violascenti-pallidum. Hymenium sat tenue, epithecio vulgo violascente, KHO aeruginoso. Perithecium in margine subviolascens, KHO intensius violascens. Sporae bacillares, breves, 3-septatae, subrectae.

Distr. Ad corticem vetustum alni prope Habitationem Sacerdotis in Tammela in Ta. (A. Kullhem).

Facie externa *B. quercicolam* f. *bacilliferam* et *B. sparsam* in memoriam revocans. Sporis et thallo a forma apotheciis obscuris instructa *B. inundatae* differt. A *B. abbreviante* sit evoluta, epithecio ab ea recedens. — Hypothallus indistinctus. Apothecia lat. 0.4—0.3 mm, crass. 0.220 mm, sat crebra numerosaque, nuda, disco opaco, atro aut interdum fusco-nigricante, margine sat opaco aut leviter nitido, discum leviter superante. Hypothecium superne subplectenparenchymaticum, cellulis in seriebus horizontalibus, cavitatibus depressis aut rotundatis, 0.003—0.001 mm latis, membranis modice incrassatis, inferne decoloratum, chondroideum, tubulis partim oblongis. Perithecium chondroideum, pachydermaticum, cavitatibus cellularum rotundatis aut ellipsoideis et in parte interiore oblongis, 0.002—0.0015 mm latis, ex hyphis radiantibus formatum. Hymenium 0.040—0.050 mm crassum, jodo caerulescens deindeque vinose rubens. Hymenium superius violascens aut dilute subnigricans aut decoloratum, at KHO distincte aeruginosum. Paraphyses sat laxe cohaerentes, simplices, crass. 0.0015 mm, apice capitato-clavatae, 0.002—0.005 mm crassae. Sporae bacillares, apicibus obtusis, long. 0.012—0.019, crass. 0.002 mm. Stylosporae oblongae aut cylindrico-oblongae, apicibus obtusis aut rotundatis, rectae, simplices, decolores, long. 0.007—0.005, crass. 0.0015 mm, in conceptaculis prominentibus, fusconigris, diam. 0.130 mm. Gonidia pleuro-coccoidea, simplicia aut glomerulosa, cellulis globosis, diam. 0.012—0.008 mm.

26. *B. quercicola* (Nyl.) Vain.

Lecidea muscorum var. *quercicola* Nyl. in Theden. Bidr. Stockh. Läfveg. (1852) p. 169; Nyl. in Nya Bot. Not. 1852 p. 175. *L. vermifera* var. *quercicola* Nyl. l. c. 1853 p. 98. *L. quercicola* Nyl. Lich. Paris (1896) p. 85 (synon. *L. bacilliferae* Nyl.). *L. holomelaena* var. *vermifera* Nyl. Herb. Lich. Par. III (1856) n. 136 (n. 17139 in herb. Nyl.). *L. umbrina* **L. bacillifera* Nyl. Lich. Scand. (1861) p. 210 p. p. (excl. var.). *L. bacillifera* Nyl. in Fellm. Lich. Arct. (1864) n. 173 (in herb. Nyl.), Lich. Lapp. Or. (1866) p. 154 p. p., Lich. Paris (1896) p. 85; Norrl. Bidr. Sydöstr. Tav. Fl. (1870) p. 189. *Bacidia abbrevians* Th. Fr. Lich. Scand. II (1874) p. 362 p. p. *B. atrosanguinea* α. *corticola* f. *curtula* Th. Fr. l. c. (1874) p. 356 (teste Hedl. Krit. Bem. Lec. Micar. p. 71). *Lecidea bacillifera* f. *circumspecta* Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 185; Vain. Adj. Lich. Lapp. II (1883) p. 22. *L. circumspecta* Hedl. Krit. Bem. Lec. Micar. (1892) p. 71. *Bacidia circumspecta* Malme Lich. Suec. Exs. IV (1908) n. 89.

Exs. Nyl. Lich. Paris III (1856) n. 136. — Fellm. Lich. Arct. (1864) n. 173. — Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 185. — Malme Lich. Suec. Exs. IV (1908) n. 89.

Thallus tenuissimus aut tenuis aut evanescens. Apothecia parva aut sat parva, basi constricta, adpressa aut sat late adnata, disco atro, plano aut demum convexo, margine tenui, atro, persistente aut demum excluso. Hypothecium pallidum aut lutescens aut decoloratum aut raro partim dilute subroseum. Hymenium sat tenue, epithecio cyanescente aut sordide aeruginoso, KHO non reagente aut distinctius aeruginoso. Perithecium in margine subviolascens. Sporae bacillares, sat longae aut vulgo mediocres, vulgo pluri-septatae, vulgo rectae. Corticola.

Distr. Ad corticem Salicis capreae et Sorbi, rarius Juniperi, Abietis, Populi et Tiliae crescit, in provinciis meridionalibus passim obveniens et septentrionem versus rarescens. In Ta.: Pluribus locis lecta, ibi etiam ad Veijo in Korpilahti (Vain.). Sa: Ad Savonlinna (O. A. J. Carlenius). Tb.: Sutonen in Korpilahti (Vain.). KVien. occ.: Koroppi in Repola (Vain.). OKaj.: Hiidenvaara in Kuhmo (ad corticem populi in abiegnio), Hevoisvaara in Kianta (Vain.). KKER.: Ad Koutajärvi (N. I. Fellm. Lich. Arct. n. 173). Haec specimina ad formas sequentes pertinent:

F. bacillifera (Nyl.) Vain.

Apothecia partim majora, disco persistenter aut diu plano, margine subpersistente. Perithecium in margine subviolascens.

Distr. Prope Helsingforsiam (Vain.), ad Mustiala in Tammela (A. Kullhem), in Tiirismaa in Hollola (Vain.), ad Nyystölä in Padasjoki (Vain.), ad Veijo in Korpilahti (Vain.), ad Savonlinna (O. Carlenius), ad Hevoisvaara in Kianta (Vain.).

Apothecia lat. 0.35—0.9 mm, margine tenui, habitu fere sicut in *B. abbreviante*. Sporae long. 0.022—0.036 (ex annot. in herb. Nyl. „—0.035“), crass. 0.002—0.003 mm, septis 3—5 (—8). Perithecium superne sordide subviolascens, inferne dilutius coloratum aut decoloratum.

F. circumspecta (Nyl.) Vain.

Apothecia parva, disco vulgo demum convexo, margine tenuissimo, vulgo demum aut mox excluso. Perithecium in margine subviolascens.

Distr. In Vanha-Viipuri et Monrepos ad Viburgum (Vain.), ad Evo in Lammi (Norrl. l. c. n. 185), ad Sutonen in Korpilahti (Vain.), ad Koroppi in Repola (Vain.), ad Hiidenvaara in Kuhmo (Vain.), ad Koutajärvi in KKER. (Fellm. l. c. n. 173).

Thallus cinereo-glauescens aut pallidus, verruculosus aut saepe evanescens, hypothallo indistincto. Apothecia crass. 0.20—0.12 mm, lat. 0.3 (0.25—0.6) mm, nuda, vulgo depresso-convexa. Hypothecium parte superiore subplectenparenchymaticum, cellulis in seriebus horizontalibus aut irregulariter dispositis, cavitatibus subglobosis aut ellipsoideis aut depressis, 0.0015—0.003 mm latis, membranis modice incrassatis, conglutinatis, inferne partim aut medio chondroideum cavitatibusque longioribus. Perithecium chondroideum aut subchondroideum, hyphis radiantibus, pachydermatis, conglutinatis, cavitatibus ellipsoideis aut oblongis, 0.0015—0.003 mm latis, in margine sordide violascens, KHO non reagens, inferne vulgo decoloratum. Hymenium 0.035—0.060 mm crassum, jodo plus minus caerulescens deindeque vinose rubens. Hymenium superius aeruginosum aut cyanescenti-nigricans aut raro partim parce olivaceo-nigricans, KHO vulgo distinctius aeruginosum. Hymenium inferius interdum (in planta ad Gesterby in Kyrkslätt a G. Lång lecta et in Norrl. et Nyl. H. L. F. n. 185) KHO dilute sordide violaceum. Paraphyses simplices, sat arcte cohaerentes, apice clavatae. Sporae bacillares, apicibus obtusis, rectae, septis vulgo 3—6, long. 0.017—0.033, crass. 0.0015—0.003 mm. Gonidia pleurococcoidea, simplicia aut saepe glomerulosa, membrana modice incrassata.

F. cyanocalyptra Vain.

Apothecia sat parva, disco vulgo demum depresso-convexo, margine tenui, persistente aut demum excluso. Perithecium in margine partim extus subaeruginosum.

Distr. Ad corticem Juniperi prope Gesterby in Kyrkslätt in N. (G. Lång) et ad Mustiala in Ta. (A. Kullhem).

Apotheciis habitu est intermedia inter f. *bacilliferam* et f. *circumspectam*. Apothecia lat. 0.8—0.3 mm, disco vulgo depresso-convexo, rarius persistenter plano, margine persistente aut demum excluso. Perithecium in margine totum aeruginosum aut in specimine a Kullh. lecto partim obscure violascens et partim tantum extus aeruginosum, KHO non reagens. Hymenium superius aeruginosum, KHO non reagens. Sporae long. 0.018—0.028, crass. 0.0015—0.002 mm, septis 3—5. — Huc etiam Malme Lich. Suec. Exs. n. 89 in mus. Fenn. pertinet.

Obs. 1. *L. muscorum* var. *quercicola* Nyl. in Theden. Bidr. Stockh. Lafveg. (1852) p. 169 secund. specim. orig. n. 17235 in herb. Nyl., apotheciis instructa est 0.2—0.49 mm latis, 0.2—0.12 mm crassis, depresso-convexis, immarginatis, late adnatis, thallo sat tenui, verruculoso, cinereo-pallido, epithecio nigricante aut cyanescenti-vel aeruginoso-nigricante, partim parce etiam olivaceo-nigricante, KHO distincte aeruginoso, hypothecio albedo aut fusciscente et extus aut toto pallido. Sporae bacillares, rectae, long. 0.021—0.028, crass. 0.0015 mm („long. 0.023—0.030, crass. 0.002—0.0025 mm“ observante Nyl.), 3-septatae.

Obs. 2. *Bacidia abbrevians* f. *expallens* Th. Fr., Lich. Scand. II (1874) p. 362, ad corticem Salicis prope Mustiala a P. A. Karsten lecta, „apotheciis in fuscum vergentibus (praecipue margine excipuloque), paraphysum apicibus dilutis“, exactius non est cognita.

27. *B. abbrevians* (Nyl.) Th. Fr.

Lich. Scand. II (1874) p. 362 p. p.; Arn. Lich. Fränk. Jur. (Fl. 1884) p. 187 p. p. *Lecidea bacillifera* f. *abbrevians* Nyl. Fl. 1869 p. 413, Norrl. Bidr. Sydöstr. Tav. Fl. (1870) p. 189; Vain. Adj. Lich. Lapp. II (1883) p. 22. *L. bacillifera* **L. abbrevians* Norrl. Ber. Torn. Lappm. (1873) p. 337. *L. abbrevians* Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 186; Hedl. Krit. Bem. Lec. Micar. (1892) p. 71. *Bacidia bacillifera* f. *abbrevians* Arn. Lich. Fragm. XI (Fl. 1871) p. 53. *Lecidea umbrina* **L. bacillifera* Nyl. Lich. Scand. (1861) p. 210 p. p. *L. bacillifera* Nyl. Fl. 1869 p. 413; Malme Lich. Suec. Exs. IV (1908) n. 90.

Exs. Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 186, cont. (1921) n. 718, 719. — Malme l. c.

Thallus vulgo tenuissimus aut evanescens. Apothecia sat parva aut mediocria, basi constricta, disco atro, plano aut raro depresso-convexo, margine tenui aut sat tenui, vulgo atro, persistente aut rarius demum excluso. Hypothecium superne pallidum lutescensve aut totum decolora-

tum. Hymenium sat tenue, epithecio vulgo subaeruginoso, KHO distinctius aeruginoso. Perithecium in margine vulgo subviolascens. Sporae breves, bacillares oblongaeve, 3-septatae, rectae. Corticola.

Distr. Ad corticem Betulae et rarius Salicis capreae, Populi, Alni, Juniperi et Abietis, raro etiam ad Polyporum igniarium et ad lignum Betulae crescit, in provinciis meridionalibus passim vel sat frequenter obveniens et septentrionem versus rarescens. Tb.: Ad Piililä, Sutonen, Rutalahti (Vain.) et Templum (Norrl.) in Korpilahti, Tourujoki in Jyväskylä (Vain.). Kb.: Nevala in Lieksa (f. *spurca*: Vain.). OKaj.: Paltamo (F. Silén), Kylmälä, Ohtosenvaara in Kuhmo (Vain.), Hossa in Kianta (Vain.). Kuus.: Siikaluoma (F. Silén). KJer.: Knjäsa (P. A. Karsten). LKem.: Jerisjärvi (Norrl.). LIm.: Rasnavolok prope Imandra (P. A. Karsten et n. 17201 in herb. Nyl.), Kitschakoski in Umpjoki (A. O. Kairamo). LIn.: Hammastunturit, reg. subalpina (F. Silén).

Thallus saepe parce verruculosus, albidus aut cinerascens, vulgo parum distinctus, hypothallo indistincto aut interdum cinerascente aut (in f. *spurca* Vain. l. c. p. 23) maculas latas nigricantes formante. Apothecia lat. 1.2—0.3 mm, sparsa aut partim sat crebra, vulgo adpressa, crass. 0.220—0.340 mm, disco opaco, nudo, margine nudo, saepe nitido, atro aut raro in nonnullis apotheciis rufescente. Hypothecium in parte superiore subchondroideo-plectenparenchymaticum, cellulis in seriebus subhorizontalibus, cavitatibus parvis, depressis, membranis modice incrassatis, inferne chondroideum, hyphis pachydermaticis, ramoso-connexis, irregulariter contextis, conglutinatis. Perithecium chondroideum, hyphis radiantibus, conglutinatis, pachydermaticis, tubulis angustis, inferne decoloratum. Hymenium 0.040—0.055 mm crassum, jodo caerulescens deindeque vinose rubens. Paraphyses simplices, apice clavatae et 0.0015—0.004 mm crassae, aeruginosae aut raro olivaceae, at KHO aeruginosae. Sporae long. 0.012—0.020 (—0.23), crass. 0.0015—0.0035 mm. Conidia (ex annot. Nyl. in n. 17223) filiformia, modice arcuata, long. 0.011—0.013, crass. 0.0006 mm. Stylosporae (ex annot. Nyl. in m. F.) oblongae, rectae, apicibus rotundatis, long. 0.008—0.009, crass. 0.0025 mm. Gonidia pleurococcoidea, simplicia aut glomerulosa aut 2-cellulosa visa, membrana leviter incrassata.

Obs. 1. *Lecidea igniarii* Nyl., Fl. 1867 p. 328 (Norrl., Bidr. Sydöstr. Tav. Fl., 1870, p. 187), secundum specim. orig. n. 17232 in herb. Nyl., ad Polyporum igniarii in Hollola in Tavastia austr. a Norrl. lectum, thallo modice incrassato, verruculoso-inaequali vel verruculoso, sordide albicante, a *B. abbreviante* leviter recedit, notis internis cum ea congruens, et in specimine ad Evo in Ta. item a Norrl. lecto thallo normali tenui instructa est. „*L. bacillifera* **L. abbrevians*“ in Norrl. Ber. Torn. Lappm. (1873) p. 337, ad Polyporum vetustum in reg. abietina ad Muonio lecta (Norrl.), thallo verrucoso et verruculoso, modice incrassato et perithecio in margine summo extus aeruginoso et intus obscure violascente instructa est.

Obs. 2. Ad corticem Betulae in Laivo prope Kuopio in Sb. a K. Linkola lecta est forma in *B. affinem* var. *separabilem* (Nyl.) accedens, hypothecio superne partim fuscescenti-rubricoso, partim sordide pallido, partim pallido, in aliis apotheciis autem hypothecio maxima parte pallido et tantum parce dilute rubricoso-pallido. Nominetur f. *transscendens* Vain. Apothecia plana, marginata, crass. 0.2 mm, habitu *B. abbreviantis*. Paraphyses crass. 0.0015 mm, apice subclavatae et 0.002—0.003 mm crassae et aeruginosae, KHO smaragdulae. Perithecium in margine sordide subviolascens. Sporae bacillares, long. 0.012—0.016, crass. 0.002—0.003 mm, 3-septatae.

Obs. 3. „*L. bacillifera* **abbrevians* Nyl.“ in Norrl. Ber. Torn. Lappm. (1873) p. 346, ad corticem Betulae prope Turtola in Ob. a Norrl. lecta, inter *B. abbreviantem* et *quercicolam* est intermedia, apotheciis convexis, immarginatis aut parce etiam planis marginatisque, parvis, lat. 0.25—0.3 mm, habitu sicut in *B. quercicola* f. *circumspecta*, at sporis long. 0.020—0.005, crass. 0.0015 mm, 3-septatis aut vulgo simplicibus, epithecio sordide cyanescente, KHO aeruginoso, perithecio in margine sordide violaceo, KHO distinctius violascente, hypothecio pallido. Nominetur *B. abbrevians* f. *Turtolensis* Vain.

28. *B. sororians* (Nyl.) Vain.

Lecidea Nyl. Fl. 1875 p. 445; Hue Addend. Lich. Eur. II (1888) p. 163; Vain. Fl. Tav. Or. (1878) p. 114. *Bilimbia* Blomb. et Forss. En. Pl. Scand. (1880) p. 82.

Thallus modice incrassatus, e verrucis et verruculis constans confertis aut dispersis, cinereo-glauciscentibus. Apothecia parva, simplicia aut vulgo tuberculoso-confluentia, adnata, basi leviter constricta, nigra, convexa, immarginata. Hypothecium subdecoloratum aut olivaceum. Hymenium sat tenue. Epithecium olivaceo-fuscescens aut

partim dilute olivaceum, KHO non reagens. Sporae bacillares, breves, 3-septatae, subrectae.

Distr. In rupe prope Raianlahti in Korpilahti in Ta. (Vain.) una cum Stigonemate minuto (saxicola) et Biatorella torvula (Nyl.).

Facie externa *Bilimbiam trisepta* (Naeg.) in memoriam revocat, sed sporis tenuioribus ab ea differt. *Bacidiae umbrinae* var. *orthosporae* proxima sit et forsani variatio ei analoga *B. umbrinae*. Thallus opacus, hypothallo indistincto. Apothecia simplicia lat. 0.2 mm, vulgo tuberculoso-confluentia proliferave, tubercula 0.7—1 mm lata formantia, nuda, opaca, bene aut depresso convexa, margine excluso. Hymenium circ. 0.040—0.050 mm crassum, jodo caerulescens, dein fulvescens, ascis subviolascens. Hypothecium ex hyphis erectis, conglutinatissimum formatum, subplectenparenchymaticum, cavitatibus cellularum rotundatis ellipsoideisve, parcius etiam oblongis, lat. 0.0015—0.002 mm, membranis modice incrassatis, KHO non reagens. Perithecium tenue, partim olivaceofuscescens (KHO rufescens), partim olivaceo-pallidum, plectenparenchymaticum, cavitatibus subellipsoideis, 0.001—0.0015 mm latis, membranis sat tenuibus, ex hyphis radiantibus, conglutinatissimum formatum. Paraphyses arcte cohaerentes, crass. 0.0015 mm, crebre septatae, ramoso-connexae, gelatina hymeniali haud abundante. Asci clavati, in apice membrana haud incrassata. Sporae „long. 0.015—0.025, crass. 0.002—0.0025 mm, apicibus obtusis“ (secund. annot. Nyl. in herb. suo). Gonidia pleurococcoidea, simplicia diam. 0.008—0.004 mm, etiam 2-cellulosa et glomerulosa, membrana sat tenui.

29. *B. umbrina* (Ach.) Th. Fr.

Lich. Scand. II (1874) p. 365. *Lecidea* Ach. Lich. Univ. (1810) p. 183, Syn. Lich. (1814) p. 35; Nyl. Lich. Scand. (1861) p. 209 (excl. var.); Norrl. Bidr. Sydöstr. Tav. Fl. (1870) p. 189; Vain. Adj. Lich. Lapp. II (1883) p. 23. *Secoliga umbrina* Stizenb. Krit. Bem. Lec. Nadelf. Sp. (1863) p. 25. *Lecidea pelidna* Ach. Lich. Univ. (1810) p. 158 p. p.; Nyl. Obs. Lich. Pyr. (Fl. 1872) p. 11, Lich. Paris (1896) p. 86. *L. holomelaena* Floerk. in Spreng. Syst. Veg. IV (1828) p. 206; Schaer. Enum. Lich. Eur. (1850) p. 134 p. p. *Scoliciosporum holomelaenum* Mass. Ric. Lich. Crost. (1852) p. 104; Koerb. Parerg. Lich. (1861) p. 240. *Lecidea luteola* * *L. holomelaena* Nyl. Prodr. Lich. Gall. (1857) p. 361. *Biatorella streptospora* (Naeg.) Hepp Flecht. Eur. (1860) n. 523. *Bacidia asserculorum* Th. Fr. Lich. Arct. (1860) p. 181 (Lich. Scand. II p. 474, 475).

Thallus modice incrassatus aut crassus tenuisve, verruculoso-inaequalis aut verruculosus, dispersus, obscure cinereo-virescens aut olivaceus cinerascensve. Apothecia vulgo parva, sessilia, late adnata, basi leviter constricta, disco convexo aut primum depresso-convexo planiusculove, nigricante aut fusco-nigricante aut raro fusco-rufescente, margine indistincto aut tenuissimo et demum excluso, subconcolore. Hymenium tenue aut sat tenue. Epithecium aeruginosum aut olivaceum aut fuscescens pallidumve, KHO parum reagens. Hypothecium pallidum aut decoloratum, plectenparenchymaticum. Perithecium pallidum aut partim olivaceo-pallidum vel dilute rufescens, KHO non reagens, subplectenparenchymaticum. Sporae aciculari-vermiculares, spiraliter contortae aut raro subrectae, longitudine mediocres aut sat breves, sat tenues aut modice incrassatae, pauci-septatae aut pluri-septatae.

Distr. Praesertim ad corticem Alni, saepe etiam ad saxa et rupes et ad saepimenta lignea vetusta crescit, raro ad corticem Salicis capreae lecta. In provinciis meridionalibus et mediis satis est frequens, septentrionem versus rarescens et in Lapponia rara.

Thallus opacus, hypothallo indistincto aut obscure cinerascens. Apothecia sparsa aut crebra aut conferta vel tuberculoso-confluentia, simplicia lat. 0.15—0.3, rarius —0.8 mm, crass. circ. 0.100—0.180 mm, haud pruinosa, disco nitido aut opaco, margine haud prominente, vulgo disco concolore. Hymenium 0.040—0.050 mm crassum, jodo caerulescens, dein vinose rubens. Hypothecium pallidum aut decoloratum, KHO non reagens, plectenparenchymaticum, cavitatibus cellularum rotundatis aut difformibus, 0.0015—0.005 mm latis, in series irregulariter verticales dispositis, membranis conglutinatis, leviter aut modice incrassatis. Perithecium tenue, 0.030—0.045 mm crassum, ex hyphis formatum irregulariter radiantibus, membranis leviter aut modice incrassatis (comparate sat tenuibus), cavitatibus cellularum oblongis aut ellipsoideis rotundatisve, 0.0015—0.0025 mm latis, pallidum aut in margine olivaceo-pallidum vel dilute rufescens, KHO non reagens. Paraphyses arcte cohaerentes, simplices aut rarius ramosae aut parvisse ramoso-connexae, crass. 0.0008—0.001 mm, apice haud aut leviter clavato-incrassatae (0.0015—0.003 mm). Asci clavati, long. 0.040—0.050, crass. 0.012—0.014 mm. Sporae

aciculari-vermiculares, apicibus sat obtusis aut sat acutis aut altero apice obtuso et altero sensim attenuato, bene contortae aut raro rectae, at arcuatis vel spiraliter flexuosis immixtae in eodem apothecio, septis 3—7 (raro — 15, observante Stizenb. l. c. p. 27), long. 0.024—0.034, crass. 0.0015—0.003 mm (long. 0.020—0.040 mm secundum Stizenb. l. c. p. 26, long. etiam 0.048 mm secund. annot. Nylandri in herb. suo). Conidangia „verrucarioidea, nigra“, conidia „recta, long. 0.008—0.011, crass. 0.0005 mm“ secund. annot. Nylandri in bibliotheca sua (in opere citato Stizenb. p. 26). Gonidia pleurococcoidea, simplicia diam. 0.008—0.016 mm, saepe etiam 2—4-cellulosa, membrana vulgo incrassata.

Var. *psotina* (Fr.) Th. Fr. Lich. Scand. II (1874) p. 365. *L. umbrina* v. *psotina* Vain. Adj. Lich. Lapp. II (1883) p. 23. *Biatora fuliginea* γ. *psotina* Fr. Vet. Ak. Handl. 1822 p. 265. *Lecidea pelidna* Nyl. Lich. Paris (1896) p. 86 (typus).

Exs. Flot. Lich. Schles. (1829) n. 191. — Zwackh Lich. Exs. (1853) n. 197. — Hepp Flecht. Eur. III (1860) n. 523, 524. — Arn. Lich. Exs. (1866) n. 302, (1880) n. 869. — Rabenh. Lich. Eur. XXVIII (1866) n. 756.

Thallus tenuis aut modice incrassatus aut rarius crassus, cinereo-virescens aut olivaceus cinerascensve. Apothecia nigricantia. Epithecium olivaceum aut superne subfuscescens et inferne aeruginosum aut partim fuscescens in eodem apothecio. Sporae spiraliter contortae.

Distr. Ad corticem Alni, saxa et saepimenta lignea lecta. N.: Helsingforsia, Degerö, Vanhakaupunki (Vain.). KOn.: Suojärvi, Kentjärvi (J. P. Norrlin). Ta.: Sat frequ. sec. annot. meas, in Herala, Hersala, Häyhtö in Hollola (Vain.), Asikkala (Norrl.), Jokioinen et Sikomäki in Padasjoki (Vain.), Vanhoinen et Tientaali in Luhanka (Vain.), Peuha et Vuarunvuori, Veijo in Korpilahti (Vain.). Sb.: Päivärinne et Siikalahti prope Kuopio (K. Linkola). LIn.: Tscharminniemi in regione pini-fera (Vain.).

Var. *compacta* (Koerb.) Th. Fr. Lich. Scand. II (1874) p. 365. *Scoliciosporum compactum* Koerb. Syst. Lich. Germ. (1855) p. 268. *Lecidea pelidna* f. *compacta* Vain. Fl. Tav. Orient. (1878) p. 114; Nyl. Lich. Paris (1896) p. 86. *L. umbrina* v. *compacta* Vain. Adj. Lich. Lapp. II (1883) p. 23. *Scoliciosporum umbrinum* Arn. Lich. Münch. (1891) p. 90.

Exs. Rabenh. Lich. Eur. 17 (1859) n. 492, 18 (1860) n. 500, 33 (1871) n. 896. — Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 182. — Lojka Lich. Hung. Exs. IV (1882) n. 171.

Thallus crassus aut modice incrassatus, nigricanti-subaeruginosus aut obscure cinereo-virescens aut cinerascenti-olivaceus. Apothecia atra. Epithecium aeruginosum aut in eodem apothecio partim subolivaceum. Sporae spiraliter contortae.

Distr. Ad saxa et rarius ad saepimenta lignea locis apricis siccisque crescit. N.: Helsingforsia, Villa Arabia, Huopalahti (Vain.). Ka.: Viburgum et Uuras (Vain.). Ta.: Herala, Lahti in Hollola (Vain.), Haukkavuori, Piililä, Vuurunvuori in Korpilahti (Vain.). Tb.: Kanavuori in par. Jyväskylä (Vain.).

Var. **turgida** (Koerb.) Th. Fr. Lich. Scand. II (1874) p. 365. *Scoliciosporum turgidum* Koerb. Parerg. Lich. 3 Lief. (1861) p. 241 [haud *Lecidea turgida* (Ach.) Schaer.]. *Secoliga umbrina* var. β *turgida* Stizenb. Krit. Bem. Lec. Nadelf. Sp. (1863) p. 26. *Scoliciosporum umbrinum* f. *turgidum* Arn. Lich. Fragm. XI (Fl. 1871) p. 51. *L. umbrina* v. *turgida* Vain. Fl. Tav. Or. (1878) p. 114. *Lecidea holomelaena* Schaer. Lich. Helv. Exs. (1847) n. 536 secund. Koerb. Syst. Lich. Germ. p. 269 (nec Floerk. in Spreng. Linn. Syst. Veg. IV, 1828, p. 526, nec *L. crustulata* v. *holomelaena* Flot. Lich. Schles., 1829, n. 191 secund. specim. in herb. Nyl.); Nyl. Herb. Lich. Par. III (1856) n. 136. *Scoliciosporum holomelaenum* Koerb. l. c. *Lecidea pelidniza* Nyl. Fl. 1874 p. 318. *L. pelidna* var. *pelidniza* Nyl. Lich. Paris (1896) p. 86.

Exs. Schaer. Lich. Helv. Exs. XXII (1847) n. 536. — Nyl. Herb. Lich. Par. III (1856) n. 136. — Koerb. Lich. Select. Germ. VII (1861) n. 194. — Zwackh Lich. Exs. (1861) n. 417, (1880) n. 585, (1881) n. 655, (1884) n. 896, (1898) n. 1187. — Anzi Lich. Langob. III (1861) n. 117. — Arn. Lich. Exs. (1866) n. 328 a. — Hepp Flecht. Eur. IV (1867) n. 748. — Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 183.

Thallus tenuis aut modice incrassatus, cinereo-virescens cinerascensve. Apothecia fusciscentia aut nigricantia et humida fusciscentia aut rarius partim rufa. Epithecium fusciscentia aut rarius pallidum. Sporae spiraliter contortae.

Distr. In lateribus saxorum rupiumque et ad corticem alni, raro etiam Salicis capreae (etiam Fagi et Quercus ceterarumque arborum in Europa merid.) crescit. N.: Helsingforsia (Vain.). Ta.: Mustiala (A. Kullhem), Herala et Hersala in Hollola, Nyystölä in Padasjoki (Vain.), Evo (J. P. Norrlin). Tb.: Peuha, Haukkavuori, Sutosenniemi in Korpilahti (Vain.), Kanavuori in par. Jyväskylä (Vain.). KOn.: Kentjärvi (Norrl.), Tiudie (A. Kullhem). OKaj.: Kajaani (K. P. Malmgren).

Obs. „Sporae paullo breviores“, observante Th. Fr. l. c., at a me visae long. 0.028—0.032 mm et in specim. ad Peuha lecto secund. Nyl. in sched. long. 0.332—0.048 mm.

Var. *orthospora* Vain.

Thallus tenuis aut sat tenuis, obscure cinereo-virescens. Apothecia nigra. Hymenium superius aeruginosum et partim in eodem apothecio olivaceum, strato gelatinoso summo olivaceo. Sporae rectae et parce arcuatae in eodem apothecio.

Distr. Ad saepimenta vetusta in Papula et Uuras prope Viburgum (Vain.). — Non sit autonoma species, facie externa *B. umbrinae* v. *psotinae* consimilis, et sporis parce arcuatis, quales parce etiam in aliis var. observantur, in eam transit. Apothecia convexa, nigra, opaca aut leviter nitida, nuda, crebra, margine inconspicuo, textura sicut in *B. umbrina*. Sporae aciculares aut rarius subfusiformes, rectae aut parce arcuatae, apicibus sat obtusis aut sat acutis aut altero apice obtuso, long. 0.030—0.034, crass. 0.0025—0.003 mm, 3—7-septatae. Hymenium 0.050 mm crassum. Paraphyses simplices, crass. 0.0008—0.001 mm, apice haud incrassatae. Epithecium KHO non reagens. Hypothecium pallidum, plectenparenchymaticum, seriebus cellularum irregulariter verticalibus. Gonidia pleurococcoidea, saepe divisa.

Obs. 1. *F. leptomerea* (*Lecidea leptomerea* Sommerf. Suppl. Fl. Lapp., 1826, p. 161) thallo tenui, ochraceo a var. *psotina* differt (secund. Th. Fr. l. c. p. 366). Ad rupem ferruginosam in Sikomäki in Padasjoki (Vain.).

Obs. 2. *Bacidia holomelaena* c. *corticicola* Anzi, Cat. Lich. Sondr. (1860) p. 71, Lich. Langob. (1861) n. 260, (1868) n. 515, ad *B. incompactam* Borr. pertinet. *B. holomelaena* var. *corticola* Zwackh, Lich. Exs. (1861) n. 417, Enum. Lich. Heidelb. (Fl. 1862) p. 125, est *B. umbrina* var. *turgida* (Koerb.) Vain. corticola, thallo tenui, cinereo-virescente aut cinereo-olivaceo et apotheciis fusciscentibus instructa. Ad hanc f. *corticolam* (Zwackh) specimina sub v. *turgida* supra indicata, ad corticem Alni in Sutosenniemi et ad corticem Salicis capreae in Haukka-vuori in Korpilahti collecta, pertinent. — Huic analoga f. *alnicola* Vain., thallo tenui, cinereo-olivaceo, apotheciis nigris instructa, ad v. *psotinam* supra relata, ad Alnos sat frequenter in Tavastia et prope Helsingforsiam occurrit. — „*Scoliciosporum corticolum*“ in Arn. Lich. Exs. (1898) n. 328 b (Zwackh Lich. Exs., 1898, n. 1187), ad corticem Sarothamni in Oldenburg a Sandstede lectum, thallo soraliis insperso et apotheciis rufescentibus a *B. umbrina* var. *turgida* differens, notis internis apotheciorum sporisque ei consimile, ad *Bacidiam sarothamni* Vain. pertinet. — *Scoliciosporum compactum* a. *asserculorum* Koerb., Syst. Lich. Germ. (1855) p. 269, Parerg. Lich. (1861) p. 240, ad specimina lignicolas praesertim var. *compactae* spectant. *L. pelidna* v. *compacta* f. *asserculorum* Vain., Lich. Vib. (1878) p. 65, ad ligna et cortices Alni et Pini collecta, f. *saepimentorum* a Nyl. in herb. suo (n. 17540) melius nominatur, *L. asserculorum* Ach. huc non pertinens (conf. Th. Fr. Lich. Scand. p. 474). *L. pelidna* v. *compacta* f. *saxicola* Vain., l. c. (*Scoliciosporum compactum* β. *saxicolum* Koerb., l. c.),

ad specimina saxicolas ejusdem var. spectans, thallo crassiore et apotheciis saepe confluentibus a f. *saepimentorum* Vain. differt.

30. *B. Hegetschweileri* (Hepp) Vain.

Lecidea Hepp Syst. Samml. (1852) n. 212. *Biatora atosanguinea* J. *Hegetschweileri* Hepp Flecht. Eur. (1853) n. 23 (in herb. Vain., conf. p. 156). *Secoliga atosanguinea* f. *Hegetschweileri* Stizenb. Krit. Bem. Lec. Nadelf. Sp. (1863) p. 25. *Lecidea mixta* Sommerf. Suppl. Lich. Lapp. (1826) p. 158 p. p. (nec Cent. Crypt. n. 130, nec *Biatora mixta* Fr. Vet. Ak. Handl. 1822 p. 267, secund. Th. Fr. Lich. Scand. p. 363, 574). *L. elaeochroma* var. Flot. Lich. Schles. (1829) p. 5 n. 103 (sec. n. 17503 in herb. Nyl.). *L. vermifera* Nyl. Bot. Not. 1853 p. 98 (6) p. p. (excl. var. *quercicola* Nyl.), Fl. 1866 p. 86, Herb. Lich. Fenn. (1882) n. 317. *L. umbrina* f. *vermifera* Nyl. Lich. Scand. (1861) p. 210 (excl. saxicola). *Scoliciosporum vermiferum* Arn. Lich. Fragm. XI (Fl. 1871) p. 50, Lich. Ausfl. XXX (1897) p. 215 (7); Jatta Fl. It. Lich. (1809—11) p. 658. *Bacidia vermifera* Th. Fr. Lich. Scand. II (1874) p. 363. *B. mollis* Th. Fr. Lich. Arct. (1860) p. 181 p. p. *Scoliciosporum lecideoides* Hazsl. in Koerb. Parerg. Lich. 3 Lief. (1861) p. 241; Koerb. Lich. Sel. Germ. X (1864) p. 284 (Nyl. Fl. 1866 p. 87). *Secoliga lecideoides* Stizenb. l. c. p. 23. *Bacidia lecideoides* Kullh. Not. Sällsk. F. Fl. Fenn. XI (1871) p. 273; Hellb. Ner. Laffl. (1871) p. 73.

Exs. Flot. Lich. Exs. II (1829) n. 103. — Hepp Syst. Samml. XVI (1852) n. 212. — Hepp Flecht. Eur. I (1853) n. 23. — Koerb. Lich. Sel. Germ. X (1864) n. 284 (secund. Nyl. l. c.). — Rabenh. Lich. Eur. XXXIV (1871) n. 917. — Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 317. — Malme Lich. Suec. Exs. V (1908) n. 113, XVIII (1914) n. 438.

Thallus tenuis aut rarius modice incrassatus, verrucoso- aut verruculoso-inaequalis, albidus aut rarius sordide vel glaucescenti-albicans. Apothecia parva, sessilia, late adnata, basi leviter constricta, atra, disco persistenter plano aut demum convexo, margine tenui, persistente aut demum excluso. Hymenium sat tenue. Epithecium intense rubricosum. Hypothecium decoloratum aut pallidum aut roseo-pallidum, superne plectenparenchymaticum, inferne chondroideum. Perithecium totum aut late intense rubricosum, subchondroideum. Sporae vermiculares aut aciculares aut bacillares, contortae aut rectae, longitudine mediocres aut sat breves, sat tenues aut modice incrassatae, pauciseptatae.

Var. *vermifera* (Nyl.) Vain. (videas p. 215).

Sporae maxima parte spiraliter contortae.

Distr. Ad corticem Betulae, Ulmi et Alni glutinosae locis subapertis. Ab.: Kolkka in Hannula in par. Askainen (K. Linkola), Paavola in Lohja (C. E. Boldt). N.: Helsingae prope Helsingforsiam (J. P. Norrlin et F. Elfving). Ta.: Upila in Hollola (Norrl. et Vain.).

Habitu subsimilis *Buelliae punctiformi* (Hoffm.) Mass., sed thallo albedo ab ea differens. — Thallus continuus, opacus, verrucis irregularibus, circ. 0.4—0.2 mm latis, crebris subcontiguissve aut sat crebris, interdum evanescentibus, KHO non reagens, hypothallo indistincto. Apothecia vulgo crebra, lat. 0.5—0.3 (0.15—0.7) mm, crass. 0.130—0.200 mm, haud pruinosa, disco opaco, margine vulgo haud nitido, haud aut rarius bene prominente aut demum excluso. Hymenium 0.050—0.060 mm crassum, jodo caerulescens, dein obscuratum. Epithecium intense rufescenti-rubricosum aut subpurpureum, KHO parum reagens aut fusco-rubricosum aut pulchre purpureum. Hypothecium superne plectenparenchymaticum, cellulis in seriebus horizontalibus et irregulariter dispositis, cavitatibus rotundatis aut difformibus, 0.003—0.002 mm latis, membranis sat tenuibus, inferne chondroideum et hyphis irregulariter contextis, magis pachydermaticis, conglutinatis, cavitatibus brevibus, 0.001 mm latis, totum subalbidum pallidumve aut roseo-pallidum, KHO non reagens. Perithecium chondroideo-plectenparenchymaticum, ex hyphis irregulariter radiantibus formatum conglutinatis, pachydermaticis, cavitatibus rotundatis aut elongatis, 0.002—0.003 mm latis, in margine aut totum ruforubricosum aut purpureum aut inferne extus rubricosum (et intus dilutius coloratum vel subdecoloratum), KHO fusco-rubescens aut parum reagens aut pulchre purpureum (in specimine in Askainen lecto). Paraphyses sat arcte cohaerentes, simplices aut raro furcatae, sat crebre septatae, crass. 0.001—0.0015 mm, apice parum incrassatae aut raro (in specimine in Helsingae lecto) 0.003—0.005 mm crassae. Sporae altero apice vulgo sensim attenuatae, altero vulgo obtuso, 3—5 (—8) septatae, spiraliter contortae aut nonnullae arcuatae rectaeve, long. 0.026—0.043, crass. 0.002—0.035 mm. Gonidia pleurococcoidea, simplicia, diam. 0.005—0.014 mm, saepe etiam 4-cellulosa aut glomerulosa, membrana sat tenui aut modice incrassata.

Var. *rectiuscula* (Nyl.) Vain. *Lecidea vermifera* var. *rectiuscula* Nyl. Fl. 1872 p. 355 (Th. Fr. Lich. Scand. II p. 364).

Sporae maxima parte rectae vel subrectae. Epithecium subrufescens aut rufescenti-rubricosum, raro subpurpureo-rubricosum.

Distr. Ad corticem Betulae, Juniperi, Quercus et Populi et ad lignum lecta. Ab.: Runsala (A. Kullhem). N.: Hoglandia (M. Brenner). Ta.: Mustiala et Kaukijärvi in Tammela (Kullh.). Sa.: Savonlinna (O. Carlenius).

Notis externis omnino similis var. *vermiferae*. — Hymenium 0.040—0.045 mm crassum. Epithecium intense coloratum, KHO pulchrius subrubricosum (colore fructuum Rubi idaei) aut violaceo-purpureum. Perithecium in margine colore et reactione epithecii. Paraphyses crass. 0.0015—0.001 mm, apice clavatae et 0.003 mm crassae. Sporae bacillares, apicibus obtusis, rectae aut subrectae, parce in eodem apothecio aciculares aut aciculari-vermiculares, spiraliter contortae aut arcuatae, apicibus acutis aut obtusis, long. 0.019—0.021 mm, ex annot. Nyl. in herb. suo „long. 0.015—0.036 mm“, crass. 0.002—0.003 mm, 3-septatae Pycnidia (in specimine in Savonlinna lecto) fusca in lamina tenui. KHO rubricosa. Basidia simplicia, long. 0.008—0.010, crass. 0.0015 mm. Stylosporae oblongae, rectae aut rarius leviter curvatae, long. 0.004 (—0.003), crass. 0.0015 mm. Secundum annot. Nyl. in specim. n. 17500 ad Mustiala lecto „bacillis bene arcuatis“.

Var. *haematomela* (Nyl.) Vain. *Lecidea haematomela* Nyl. Lich. Lapp. Or. (1866) p. 184. *Bacidia vermifera* **B. haematomela* Th. Fr. Lich. Scand. II (1874) p. 364.

Sporae rectae. Apothecia margine prominente aut rarius demum discum haud superante, persistente. Epithecium purpureo-rubricosum.

Distr. Ad lignum Betuli prope Petrosavodsk in KOL. (Th. Simming).

Proxima est v. *rectiusculae* (Nyl.), nec ab ea bene distincta. — Thallus albus, verruculis dispersis, hypothallus tenuissimus, cinerascens, passim subconspicuus. Apothecia 0.45—0.3 (saepè —0.2) mm lata, crass. 0.140—0.180 mm, disco nigro, opaco, plano aut raro leviter convexo, margine tenui, atro, nitido. Hymenium 0.40 mm crassum, jodo leviter caerulescens deindeque vinose rubens (secund. Nyl. in herb. suo). Epithecium intense purpureo-rubricosum, KHO pulchrius rubricosum (colore fructuum Rubi idaei). Hypothecium albidum (leviter violaceo-fuscescens sec. Nyl.), superne plectenparenchymaticum, cellulis in seriebus horizontalibus dispositis, cavitatibus ellipsoideis aut rotundatis, 0.0015—0.003 mm latis, membranis sat tenuibus, inferne chondroideum, hyphis irregulariter contextis, cavitatibus longioribus tenuioribusque, membranis leviter incrassatis. Perithecium subchondroideum vel fere plectenparenchymaticum, hyphis radiantibus, conglutinatibus, cavitatibus brevibus, rotundatis, 0.002—0.0015 mm latis, membranis leviter incrassatis, in margine intense purpureo-rubricosum (KHO pulchrius rubricosum), inferne decoloratum. Paraphyses simplices, crass. 0.0015 mm, apice clavato crass. 0.003—0.005 mm. Sporae „bacillares, rectae, 3-septatae, long. 0.016—0.025, crass. 0.002—0.003 mm“ (Nyl. l. c.). Conidia „bacillaria, recta, long. 0.007—0.009, crass. 0.0005 mm“ (sec. annot. Nyl. in herb. suo). Gonidia parce evoluta, pleurococcoidea, simplicia aut 2-cellulosa, membrana leviter incrassata.

Obs. *Lecidea leucobaea* Nyl. Fl. 1877 p. 564 (Elfv. Ant. Veg. Svir p. 169) est *Haematomma elatinum* (Ach.) Koerb.

31. *B. ophiospora* (Hellb.) Th. Fr.

Lich. Scand. II (1874) p. 367. *Scalidium ophiosporum* Hellb. Rar. Lich. Neric. (Vet. Ak. Förh. 1867) p. 269, Nerik. Laffl. (1871) p. 69, Nerik. Lafveg. (1871) p. 22. *Lecidea ophiospora* Vain. Meddel. F. et Fl. Fenn. 45 (1920) p. 140, 306. *Bacidia podicellata* Hellb. Nerik. Lafveg. (1871) p. 63 (sec. Th. Fr. l. c.).

Thallus vulgo tenuis, verruculosus, vulgo subcinerascens. Apothecia parva aut raro confluentia majoraque, basi bene constricta, sessilia aut subsessilia et partim breviter stipitata, vulgo atra, disco convexo aut plano, margine tenuissimo, vulgo demum excluso. Hymenium modice incrassatum. Epithecium subolivaceum aut aeruginosum. Hypothecium decoloratum, chondroideum. Perithecium chondroideum, extus aeruginosum aut partim olivaceum vel subviolaceum. Sporae aciculares, contortae, longitudine vulgo mediocres, sat tenues, pauci- aut pluri-septatae.

Distr. In latere umbroso rupis gneissaceae ad Vuorilampi in Neulaniemi et in Enonmäki in Enonlahti prope Kuopio in Sb. (K. Linkola).

Thallus tenuis aut partim sat crassus, partim evanescens, verruculosus, dispersus, cinerascens aut cinereo-virescens aut sordide albidus aut partim pallidus, opacus. Apothecia sat crebra, simplicia latit. 0.3—0.2 (—0.5), interdum tuberculoso-confluentia et acervos 1 mm latos formantia, vulgo atra, raro partim fuscescentia, haud pruinosa, disco opaco, margine opaco aut leviter nitido, haud prominente. Hymenium 0.060—0.080 mm crassum, „jodo primum caerulescit, dein (praecipue asci) sordide vinose rubet fulvescitve“ (Th. Fr. l. c.). Epithecium sordide olivaceum aut aeruginosum (interdum totum hymenium coloratum), KHO non reagens aut pulchre smaragdulum. Hypothecium ex hyphis formatum erectis, ramoso-connexis, pachydermaticis, conglutinatis, cavitatibus angustis, elongatis. Perithecium ex hyphis formatum radiantibus, conglutinatis, pachydermaticis, cavitatibus angustissimis, dilute aeruginosum (et KHO smaragdulum) aut extus sordide olivaceum et intus dilutius coloratum pallidumve, aut partim extus dilute sordideque subviolaceum,

aut basim versus vel totum decoloratum. Paraphyses arcte cohaerentes, partim simplices, parce praesertimque basi ramoso-connexae, gelatinam in KHO bene turgescentem percurrentes, crass. 0.001 mm, apice saepe leviter incrassatae (0.002—0.0025 mm). Asci clavati, in apice membrana bene incrassata. Sporae aciculares, spiraliter contortae, long. vulgo circ. 0.030 et crass. 0.0015 mm, „utrinque obtusiusculae, 3—7-septatae, 0.020—0.032 mm longae et 0.002—0.003 mm crassae“ secund. Th. Fr. l. c. Gonidia pleurococcoidea, simplicia et saepe etiam 2-cellulosa.

31. *B. Kuopioënsis* Vain.

Lecidea Kuopioënsis Vain. Meddel. Soc. F. et Fl. Fenn. 45 (1920) p. 140, 306.

Thallus sat tenuis aut partim modice incrassatus crassusve. Apothecia parva aut confluentia majoraque, basi bene constricta, breviter stipitata aut partim sessilia subsessiliave, disco plano aut rarius demum depresso-convexo, pallido testaceove aut raro subnigricante, margine sat tenui, superne disco concolore aut inferne pallidiore, persistente aut demum excluso. Hymenium sat tenue, totum decoloratum aut raro fumoso-obscuratum. Hypothecium pallidum aut decoloratum, superne subchondroideum. Perithecium subchondroideum, vulgo decoloratum aut pallidum. Sporae aciculares, contortae, sat breves, tenues, pauci-septatae.

Distr. In latere umbroso rupis gneissaceae ad Vuorilampi in Neulalampi prope Kuopio in Sb. (K. Linkola).

Proxime affinis est *B. ophiosporae*; forma *fumosa* Vain. in eam fere transit, et item *B. ophiospora*, apothecia fuscescentia procreans, ad *B. Kuopioënsis* accedit. Thallus verruculosus aut verruculoso-inaequalis, subcontinuus aut dispersus, saepe laxè affixus, cinereo-virescens aut partim obscure cinereo-virescens (in f. *fumosa*), opacus, hypothallo indistincto. Apothecia sparsa aut confluentia, simplicia lat. 0.3—0.6 mm, interdum tuberculoso-confluentia et acervos 1 mm latos formantia, crass. 0.200—0.220 mm (stipite non computato), haud pruinosa, disco leviter nitido aut opaco, margine nitido, haud prominente, stipite plus minus evoluto. Hymenium 0.060—0.050 mm crassum, totum decoloratum aut (in f. *fumosa*) dilutissime fumoso-obscuratum, jodo fulvescens, ascis caerulescentibus deindeque subvinose obscuratis. Hypothecium ex hyphis formatum erectis, cavitatibus rotundatis, 0.003 mm

latis, membranis sat crassis aut partim sat tenuibus, subchondroideum et sat variabile, inferne partim distincte chondroideum et irregulariter contextum. Perithecium ex hyphis formatum radiantibus, 0.0025 mm crassis, modice pachydermatis, conglutinatis, increbre septatis, cavitatibus 0.0015 mm latis, decoloratum aut pallidum aut (in f. *fumosa*) partim extus dilute rufescens. Paraphyses arcte cohaerentes, partim simplices aut basim versus parce et ambitum hymenii versus abundantius ramoso-connexae, gelatinam in KHO turgescentem dissolutamve percurrentes, crass. 0.001 mm, apice haud incrassatae. Asci paraphysibus multo breviores, long. circ. 0.040, crass. 0.014 mm, membrana in apice valde incrassata. Sporae 8-nae, aciculares, spiraliter contortae aut raro in eodem apothecio subrectae, apicibus acutis, 3-septatae, long. 0.014—0.024, crass. 0.001—0.0015 mm. Gonidia pleurococcoidea, simplicia diam. 0.008—0.012 mm, saepe etiam 2-cellulosa.

F. pallescens Vain. Apothecia pallida testaceae. — Loco supra indicato lecta (K. Linkola).

F. fumosa Vain. Apothecia superne nigricantia (simplicia). Thallus partim obscurius cinereo-virescens. — In f. *pallescentem* sine limite sensim transit, in eadem rupe, in parte minus umbrosa, cum ea crescens.

Subg. II. *Arthrorhaphis* (Th. Fr.) Vain.

Arthrorhaphis Th. Fr. Lich. Arct. (1860) p. 203, Gen. Heterol. (1861) p. 87, Lich. Scand. II (1874) p. 343. *Raphiospora* Mass. Alc. Gen. Lich. (1853) p. 11; Koerb. Syst. Lich. Germ. (1855) p. 267.

Mycobacidia defectu gonidiorum ab *Arthrorhaphide* differt et interdum hymenio jodo caerulescente instructa est (conf. Vain. Lich. Ins. Philipp. III, 1921, p. 74).

Thallus sorediosus aut crustaceus aut evanescens. Sporae aciculares aut bacillares, vulgo 3—pluri-septatae, decolores. Hymenium jodo non reagens. Perithecium subcarbonaceum, ex hyphis sat irregulariter contextis, conglutinatis formatum. Gonidia pleurococcoidea. Subgenus ad Fungos accedens.

Inter *Acanthaceas* exstat homonymon et anterieus genus *Rhaphidospora* Nees (1832) in forma rectiore. *Rhaphidospora* Ces. et de Not. est *Ophiobolus* Riess (conf. Sacc. Syll. Fung. II p. 337). — *Arthrorhaphis* a Th. Fries (Lich. Scand. II p. 343) ad Fungos erronee relegatur, et apotheciis jodo non reagentibus iis est proxima. E *Discomycete* fertili et e thallo *Sphyriddii* (*Baeo-*

mycetis) *byssoïdis* sterilis, „allelositismo“ (conf. Norm. Allelos. in K. Norsk. Vidensk.-Selsk. Skr. VII, 1872, p. 243) transmutato, formata est ex opinione Th. Friesii. Revera *Sphyradium* thallo KHO bene reagente, nec soredioso, et gonidiis aliis differt ab *Arthrorhaphide*, cujus thallus est sorediosus et KHO non reagens. Fungi autem soredia numquam procreare possunt, nam soredia symbiosi optime evoluta formantur, qualis tantum in lichenibus observatur.

33. *B. flavovirescens* (Dicks.) Anzi

Lich. Min. Rar. (1865) n. 262. *Lichen flavovirescens* Dicks. Fasc. Tert. Crypt. (1793) p. 13. *Lecidea* Turn. et Borr. apud Schaer. Naturw. Anz. Aug. 1818 p. 10, Lich. Helv. Spic. (1833) p. 162, Flot. N. A. Nat. Cur. XXI (1845) p. 80. *Raphiospora* Mass. Alc. Gen. (1853) p. 12; Koerb. Syst. Lich. Germ. (1855) p. 268; Arn. Lich. Frän. Jur. (Fl. 1884) p. 189. *Arthrorhaphis* Th. Fr. Lich. Arct. (1860) p. 203, Lich. Scand. (1874) p. 343. *Secoliga* Stizenb. Krit. Bem. Lec. Nadelf. Sp. (1863) p. 13. *Bacidia* Anzi Lich. Min. Rar. (1865) n. 262. *Mycobacidia* Rehm in Rabenh. Krypt.-Fl. Deutschl. Ascom. (1896) p. 338, 1259 (excl. var.); Sacc. Syll. Fung. X (1892) p. 66. *Pragmopora* Schröter Schles. Krypt. III 2 p. 128; Mig. Krypt.-Fl. Deutschl. III (1913) p. 921. *Lichen citrinellus* Ach. Nov. Act. Ac. Sc. XVI (Stockh. 1795) p. 135. *Lecidea citrinella* Ach. Meth. Lich. (1803) p. 47; Laur. in Sturm. Deutschl. Fl. II (1832) p. 28; Nyl. Lich. Scand. (1861) p. 248. *Skolekites citrinellus* Norm. Conat. Praem. Gen. Lich. (Mag. Naturvid. VII, 1852) p. 23, tab. II f. 15 c.

Exs. Floerk. Deutsch. Lich. V (1819) n. 83. — Fr. Lich. Suec. Exs. VIII (1826) n. 214 (Arn. l. c. p. 190). — Hampe Veg. Cell. Lich. (1863) n. 63 (Arn. l. c.). — Schaer. Lich. Helv. Exs. IX (1833) n. 204. — Koerb. Lich. Sel. Germ. V (1857) n. 139 (Arn. l. c.). — Rabenh. Lich. Eur. Exs. XIV (1858) n. 410, 411. — Leight. Lich. Brit. Exs. X (1858) n. 303 (Arn. l. c.). — Anzi Lich. Min. Rar. VI (1865) n. 262 (Arn. l. c.).

Thallus crassus aut modice incrassatus evanescensve, ambitu haud effigurato, e sorediis confertis constans, citrinus aut flavescens. Apothecia parva aut mediocria, atra, adpressa, vulgo sat late adnata, vulgo marginata. Hypothecium superne plus minus anguste albidum, inferne fusconigrum. Hymenium crassum. Epithecium fusconigrum, HNO₃ aeruginosum. Sporae aciculares.

Var. *citrinella* (Ach.) Vain. *Lichen citrinellus* Ach. l. c. *Lecidea flavovirescens* α. *citrinella* Schaer. Enum. Lich. Eur. (1850) p. 124. *L. flavovirescens* α. *vulgaris* Schaer. Lich. Helv. Spic. (1833) p. 162, Lich. Helv. Exs. IX (1833) n. 204. — Exs. supra indicata.

Thallus crassus aut modice incrassatus, citrinus aut flavescens.

Distr. Supra tecta vetusta terra obducta et ad terram nudam sabulosam locis siccioribus et supra muscos putridos in lateribus fissurisque rupium passim. Ab.: Nagu (F. Elfving), Bemby in Korpo (Elfv.), Kaijola in Lohja (C. E. Boldt), Haapkylä in Vihti (W. Nyl.). Ta: Oinasjärvi in Tammela (A. Kullhem), Käikälä in Koski (Vain.), Lahti (Vain.), Ronni in Lammi (C. Leopold), Arokoski in Padasjoki (Vain.), Jutinsalo, Onkisalo, Molikko, Vankunvuori, Koivisto, Lapinsaari in Luhanka, Pyhävuori, Rappukallio, Vällyvuori, Piililä in Korpilahti (Vain.). Savonia media (E. Nylander). KLad.: Lahentaustanvuoret in Kirjavalahi (J. P. Norrlin, Symb. Fl. Lad.-Kar. p. 31). Oa.: Jalasjärvi (P. A. Karsten). Tb.: Pihlajavesi (J. P. Norrlin, Vain.), Kanavuori in par. Jyväskylä (Vain.). Sb.: Selkiinkallio in Pieksämäki (Vain.). Kb.: Matovaara in Lieksa, Louhivaara et Lipinlahti in Nurmes (Vain.). KOn.: Kosagora (Th. Simming). Kar. Vien. occ.: Koroppi (Vain.). Kuus.: In reg. subalp. montium Iivaara et Nuorunen (Vain.). LENont.: Hetta, Pahtavaara in Enontekiäinen, Kaaresuanto (Norrl.). LIn: In regione pinifera ad Ruoptuinvaara et Paatsjoki (Vain.).

Thallus vulgo flavescens, KHO non reagens, soredioso-leprosus, continuus aut dispersus, granulis sorediorum tenuissimis aut grossis et verruculaeformibus, hypothallo indistincto aut inter acervulos sorediorum plus minus distincto et ex algis immixtis nigricante, acidum rhizocarpicum continens (sec. Zopf in Ann. Chem. 284, 1895, p. 117, Flechtenst., 1907, p. 402). Apothecia parce evoluta, lat. 0.8—0.25 mm, crass. usque ad 0.4 mm, saepe in hypothallo nascentia, vulgo sat late adnata, basi bene aut leviter constricta, haud pruinosa, opaca, ceterum etiam intus sicut in v. *arenicola*, disco plano, demum depresso convexo, margine sat tenui aut modice incrassato, haud raro primum prominente, vulgo persistente. Hymenium circ. 0.200 mm crassum. Epithecium fuscescens aut fusconigrum, HNO_3 aut H_2SO_4 mox aeruginosum, KHO rubricosco-rufescens. Hypothecium superne (usque ad 0.080 mm lat. albidum, inferne non differens a perithecio et fusconigrum aut rubricosco-fuscescens, at HNO_3 non reagens, KHO rubricosco-rufescens, H_2SO_4 post tempus longius aeruginosum. Pars lateralis perithecii fusconigrum, HNO_3 sordide fuscopurpureum (et in margine extus sordide aeruginosum), H_2SO_4 post tempus longius aeruginosum. Paraphyses apicem versus ramoso-connexae, ceterum laxae cohaerentes. Asci cylindrico-clavati, long. 0.100—0.120, crass. 0.012 mm (long. 0.080—0.100, crass. 0.010—0.012 mm sec. Stizenb.). Sporae „long. 0.040—0.100, crass. 0.002—0.005 mm“, septis „7—15“ (sec. Stizenb. et Th. Fr.), apice inferiore tenuissime elongato-caudato. Gonidia pleurococcoidea, globosa, diam. 0.005—0.012 mm, simplicia aut 2—3-cellulosa, membrana tenui aut sat tenui.

Var. *detrita* Vain.

Thallus verrucosus verruculosusque, flavescens.

Distr. Ad terram subarenosam supra rupem prope Mäkelä in Judinsalo in Luhanka in Ta. et in Pihlajavesi in Tb. (Vain.).

Intermedia est inter v. *citrinellam* et v. *griseam*, analoga et habitu subsimilis *B. alpinae* var. *subecrustaceae* Nyl., a qua epithecio fuscofuligineo differt. Verrucae thallinae lat. 0.7—0.15 mm, aggregatae contiguaeque aut dispersae, plus minus farinoso-sorediosae, convexae, lateribus abruptis. Apothecia in acervulis verrucarum thalli sita. Epithecium fuscofuligineum, HNO_3 aeruginosum, demum decoloratum. Hypothecium superne albidum, inferne rubricosco-fuscescens, HNO_3 rubricosco-rufescens et solutionem ejusdem coloris effundens. Perithecium laterale fuscofuligineum, in summa parte marginis HNO_3 mox aeruginosum et solutionem ejusdem coloris effundens, ceterum HNO_3 rubricosco-rufescens.

Var. *grisea* (Th. Fr.) Vain. *Arthrorhaphis grisea* Th. Fr. Lich. Arct. (1860) p. 204. *Rhaphiospora grisea* Arn. Lich. Fragm. XI (1871) p. 50. *Lecidea citrinella* forma macra arenicola Nyl. Prodr. Lich. Gall. (1857) p. 390 (144). *L. citrinella* f. *arenicola* Nyl. in Norrl. Fl. Kar. Oneg. II (1876) p. 36. *Rhaphiospora arenicola* Mudd Man. Brit. Lich. (1861) p. 186. *Secoliga flavovirescens* f. *arenicola* Stizenb. Krit. Bem. Lec. Nadelf. Sp. (1863) p. 13. *Lecidea arenicola* Leight. Lich. Great Brit. (1871) p. 356. *Rhaphiospora flavovirescens* f. *arenicola* Arn. Lich. Fränk. Jur. (1884) p. 190. *Bacidia flavovirescens* var. *arenicola* A. L. Sm. Mon. Brit. Lich. II (1911) p. 165. *Lecidea citrinella* var. *ecrustacea* Nyl. in Norrl. Ber. Torn. Lappm. (1873) p. 341.

Exs. (secund. Arn. l. c.). Leight. Lich. Brit. Exs. XII (1866) n. 372. — Arn. Lich. Exs. (1864) n. 261 a, b.

Thallus evanescens aut albidus tenuissimusque.

Distr. Supra thallum *Baeomycetis carnei* Floerk. (KHO rubescen-tem) aliorumque lichenum et supra terram arenosam nudam crescit. Ta.: Asikkala (J. P. Norrlin). Tb.: Pihlajavesi (Vain.). KOn.: Suojärvi (Norrl.). Kuus.: Iivaara (F. Silén). LEnont.: Prope Kaaresuanto (Norrl.).

Saepe in var. *citrinellam* (Ach.) transit, parce aut parcissime etiam areolas citrinas minutissimas aut majores minoresve gonidiosas procreans. Item in eodem specimine supra terram nudam et supra thallum alienum apothecia hujus varietatis observantur, quare haec planta non est vera parasita, at analoga formis ecrustaceis lichenum. Apothecia parva, lat. 0.6—0.15 mm, crass. usque ad 0.340 mm. Perithecium quasi carbonaceum, ex hyphis formatum irregulariter contextis, conglutinatis, cavitatibus oblongis aut brevioribus, 0.0015 mm latis, irregularibus, membranibus modice incrassatis, fuligineum vel fusco-nigricans,

KHO rubricosus-rufescens et saepe solutionem ejusdem coloris effundens, H_2SO_4 post tempus longius totum aeruginosum. Hymenium resinoso-guttulosum, impellucidum, jodo non reagens, at metaplasmate ascorum rubescente, circ. 0.140 mm crassum. Epithecium fuscofuligineum, KHO sicut perithecium reagens, H_2SO_4 mox aeruginosum. Hypothecium partim superne albidum (circ. 0.050—0.060 mm lat.), plecten-parenchymaticum, ex hyphis erectis formatum, cavitatibus 0.0015 mm latis aut ellipsoideis, membranis sat tenuibus, partim totum aut tantum parte inferiore fuscofuligineum, perithecio consimile, usque ad 0.140 mm crassum, KHO solutionem rubricosus-rufescentem effundens, H_2SO_4 post tempus longius aeruginosum. Paraphyses apicem versus ramoso-connexae. Asci cylindrico-clavati, long. circ. 0.100, crass. 0.008—0.012 mm. Sporae 4-nae aut 8-nae, aciculares, apice superiore obtuso aut acuto, apice inferiore sensim attenuato et valde tenui, vulgo 9—10-septatae, long. circ. 0.050—0.068, crass. 0.002—0.004 mm, observante Nyl. (in n. 12075 in Suojärvi lecto) „long. 0.095—0.100, crass. 0.005 mm“, apicem inferiorem versus sensim tenuissime elongato-caudatae.

34. B. alpina (Schaer.) Vain.

Lecidea flavovirescens var. *alpina* Schaer. Lich. Helv. Spic. (1833) p. 162, Lich. Helv. Exs. n. 532, Enum. Lich. Eur. (1850) p. 125, Vain. Adj. Lich. Lapp. II (1883) p. 24, Lich. Exp. Vegae Pitlekai (Arkiv för. Bot. 8 n. 4, 1909) p. 102. *Rhaphiospora flavovirescens* f. *alpina* Arn. Lich. Tirol XXI (1880) p. 140, XXX (1897) p. 29. *Lecidea citrinella* v. *alpina* Norrl. Öfvers. Torn. Lappm. (1873) p. 341. *L. citrinella* **alpina* Nyl. Enum. Lich. Fret. Behr. (1888) p. 25.

Exs. Schaer. Lich. Helv. Exs. XXII (1847) n. 532 (secund. cit.).

Thallus crassus, ambitu subeffiguratus, crustam abrupte limitatam aut verrucas formans, vulgo citrinus. Apothecia parva aut mediocria, atra, adpressa, vulgo sat late adnata, vulgo marginata. Hypothecium saltem inferne fusconigrum. Hymenium crassum. Epithecium aeruginoso-fuligineum, HNO_3 pulchrius aeruginosam. Sporae aciculares.

Distr. Supra muscos destructos (Andreaea petrophila) praesertimque supra et inter Stigonemata in fissuris laterum rupium, interdum etiam ad terram arenosam nudam crescit. Kb.: Kalliovaara in Lieksa (Vain.), Kylmäjärvi in Kianta (Vain.). Kuus.: In reg. subalp. montis Iivaara (Vain.). LKem.: In valle Pyhäkuru in Kuolajärvi (H. Lindberg). LEnont.: In Leutsuvaara prope Kilpisjärvi (J. P. Norrlin).

Thallus crustam usque ad 7 mm, raro 35 mm (e Leutsuvaara in mus. Fenn.) latam, continuam aut rimosam areolatamve formans aut verrucosus, saepe ambitu crenato, superficie tota aut rarius tantum partim soredioso-farinosus, citrinus aut raro flavescens, KHO non reagens, hypothallo indistincto. Apothecia rara, lat. 0.3—1.5 mm, interdum in hypothallo nascentia, sparsa aut aggregata confluentiave, sat late adnata, basi leviter constricta, haud pruinosa, opaca, disco plano, margine sat tenui, interdum primum prominente, subpersistente. Perithecium quasi carbonaceum, textura sicut in *B. flavovirescente*, fusco-nigricans, KHO parum reagens aut rubricosus-rufescens, H_2SO_4 aeruginosum. Hymenium circ. 0.100—0.150 mm crassum, resinoso-guttulosum, impellucidum, jodo non reagens. Epithecium sordide aeruginosum aut aeruginoso-fuligineum, KHO rubricosus-rufescens aut olivaceo-fuscens, HNO_3 sicut etiam H_2SO_4 pulchrius aeruginosum. Hypothecium superne partim anguste (circ. 0.040 mm lat.) albidum, textura sicut in *B. flavovirescente*, parte inferiore fusco-fuligineum, KHO rubricosus-rufescens aut parum reagens, HNO_3 sicut etiam H_2SO_4 aeruginosum. Paraphyses crass. 0.001—0.0007 mm, apice ramosae et ramoso-connexae, ceterum simplices et laxe cohaerentes, haud gelatinosae. Asci anguste ventricosoclavati, long. circ. 0.085, crass. 0.010—0.013 mm, membrana tota sat tenui aut leviter incrassata. Sporae 8-nae, polystichae, decoloratae, aciculares, rectae, apicibus acutis, long. circ. 0.035—0.054, crass. 0.003 mm, apice inferiore haud caudato. Gonidia pleurococcoidea, globosa, diam. 0.008—0.010 mm, simplicia (parce etiam 2—4-cellulosa visa), membrana tenuissima aut rarius mediocri (autosporis globosis, diam. 0.003—0.004 mm).

Var. *subecrustacea* (Nyl.) Vain. *Lecidea citrinella* f. *subecrustacea* Nyl. in Norrl. Ber. Torn. Lappm. (1873) p. 341.

Thallus e verrucis constans 0.15—0.4 mm latis, convexis, citrinis aut subflavescentibus, plus minus farinosis, sparsis aut aggregatis, parcesime evolutis, aut partim evanescens et apotheciis in hypothallo inconspicuo substratoque incluso, verrucis citrinis destituto, nascentibus.

Distr. Ad terram nudam silaceo-arenariam in reg. alpina montis Ounastunturi in par. Enontekiäinen in LKem. (J. P. Norrlin). Etiam ad Engelberg in Helvetia (Vain.).

Est analoga var. *griseae* (Th. Fr.) *L. flavovirescentis* (Dicks.). Epithecium obscure aeruginosum, KHO rubricosus-rufescens vel fuscescens, HNO_3 pulchre aeruginosum. Hymenium circ. 0.080—0.090 mm crassum, resinoso-guttulosum, impellucidum. Perithecium laterale fuscofuligineum, KHO rubricosus-fuscens, HNO_3 demum aerugino-

sum. Hypothecium superne anguste albidum, parte inferiore fusco-fuligineum, KHO rubricosco-fuscescens, HNO₃ demum aeruginosum. Asci long. circ. 0.070, crass. 0.008—0.009 mm. Sporae 4-nae aut 8-nae, long. 0.040—0.054, crass. 0.002—0.003 mm, aciculares, apice superiore obtuso aut sat acuto, apice inferiore sensim attenuato, at non tenuissime caudato-elongatae.

35. *B. fuscureagens* Vain.

Lecidea Vain. Adj. Lich. Lapp. II (1883) p. 16.

Thallus modice incrassatus aut sat tenuis, verrucosoinaequalis, albidus. Apothecia minuta, sessilia, subturbinata, nigra, disco plano, margine tenui. Hymenium crassum. Epithecium olivaceum aut smaragdulo-fuligineum, KHO fuscescens aut subviolascens. Hypothecium superne albidum, subplectenparenchymaticum, totum ex hyphis verticalibus formatum. Perithecium subplectenparenchymaticum. Sporae aciculares aut bacillares, longae, sat crassae.

Distr. Supra muscos et in ipsa rupe in latere subhumido rupis dioriticae crescit. LKem.: In confinio regionis subalpinae et silvosae in monte Pyhätunturi in Sodankylä (Vain.).

Species insignis, nulli alii affinis, ex temporibus pristinis relictæ. — Thallus continuus aut dispersus, opacus, verrucis circ. 0.3—0.15 mm latis, convexis, crebris, sorediis destitutus, KHO non reagens, *Baeomycetem roseum* in memoriam revocans, hypothallo indistincto. Apothecia elevata, basim versus sensim angustata, alt. 0.310—0.380 mm, lat. 0.25—0.3 mm, nuda, opaca, primum concaviuscula et margine tenui prominente, dein plana et fere immarginata. Hymenium circ. 0.110—0.130 mm crassum, minute guttulosum (versimiliter resinosum), jodo haud caerulescens, metaplasma ascorum rubescens. Hypothecium superne cavitatibus cellularum globosis aut partim ellipsoideis, 0.0015—0.002 mm latis, membranis modice incrassatis, inferne dilute olivaceum, cavitatibus oblongis. Perithecium 0.050—0.040 mm crassum, olivaceo-smaragdulum aut olivaceo-fuscescenti-fuligineum, KHO sordide violaceum aut subfuscescens, ex hyphis irregulariter radiantibus formatum, plectenparenchymaticum, cavitatibus cellularum 0.002—0.003 mm latis, membranis modice incrassatis. Paraphyses superne arcte, ceterum laxè cohaerentes, crass. 0.0008 mm, parce ramoso-connexae, gelatina hymeniali haud abundante. Asci clavati, numerosi, membrana tota sat tenui.

Sporae 4:nae aut 8:nae, aciculares aut bacillares, rectae aut rectiusculae, apicibus acutis aut obtusis, septis 7—12, long. 0.060—0.082, crass. 0.003—0.004 mm. Gonidia pleurococcoidea, vulgo simplicia, diam. 0.008—0.012 mm, parce 2-cellulosa et glomerulosa, membrana leviter incrassata.

Bilimbia De Notar.

Giorn. Bot. It. 1846 p. 190 (haud *Bilimbia* Reichenb. Handb., 1837, p. 294, ad *Caramboleas* pertinens, conf. Th. Fr. Lich. Scand. p. 369); Koerb. Syst. Lich. Germ. (1855) p. 211; Th. Fr. Lich. Arct. (1860) p. 182, Gen. Heterol. (1861) p. 84; Vain. Lich. Ins. Philipp. III (1921) p. 75. *Weitenwebera* Opiz in Lotos 1857 p. 235 (non Koerb. Parerga Lich. 4 Lief., 1863, p. 327). *Bacidia* sect. II. *Weitenwebera* Zahlbr. Ascol. (1905) p. 135 (et sect. I. *Arthrosporum* et sect. III. *Ropalospora* Zahlbr.). *Lecidea* subg. *Bilimbia* Vain. Etud. Lich. Brés. II (1890) p. 21.

Thallus crustaceus, uniformis, interdum sorediosus. Sporae minores brevesve, fusiformes aut oblongae elongataeve, 3—pluri-septatae, decolores, strato gelatinoso nullo indutae. Hymenium jodo reagens. Perithecium ex hyphis conglutinatiss, radiantibus (aut raro irregulariter subradiantibus) formatum. Gonidia cystotoccoidea aut pleurococcoidea aut micareoidea (haud trentepohliacea). Conidia brevissima rectaque aut rarius filiformia arcuataque.

Mycobilimbia Rehm in Rabenh. Krypt.-Fl. III (1896) p. 327 et Vouaux in Bull. Soc. Myc. Fr. 1913 p. 436 pr. p. huc, p. p. ad *Fungos* pertinet. Est nomen graeco-latinum, quare genus Fungorum *Bilimbiae* proximum, sed gonidiis destitutum, melius *Probilimbia* nominatur (videas Vain. Lich. Caucas., 1899, p. 318).

Sect. 1. **Eubilimbia** (Th. Fr.) Vain. Sporae 8:nae. 230.

A. *Paraphyses* membrana haud distincte gelatinosa.

1^o. Sporae 5-(4)—pluri-septatae.

a. Hypothecium superne obscuratum.

1. **B. lugubris** (Sommerf.) Th. Fr. Sporae apice inferiore attenuatae. Apothecia vulgo mediocria. 230.

b. Hypothecium pallidum decoloratumve aut dilute coloratum.

[8. **B. subfuscula** (Nyl.) Th. Fr. Sporae anguste fusiformes, vulgo 3-septatae, raro pluri-septatae. Apothecia parva. 240.]

2^o. Sporae 3-septatae.

† Hypothecium superne obscuratum.

2. **B. trachona** (Ach.) Arn. Thallus vulgo subglauescens. Apothecia late adnata. 232.

3. **B. calcariella** (Nyl.) Blomb. et Forss. Thallus albidus. Apothecia demum leviter constricta. 234.

†† Hypothecium superne pallidum decoloratumve aut dilute coloratum.

α. Apothecia basi bene constricta.

4. **B. sphaeroides** (Dicks.) Th. Fr. Apothecia pallida testaceave. 234.

6. **B. rivulicola** Vain. Apothecia disco fusco rufescenteve. 237.

β. Apothecia basi late adnata.

× Thallus sorediosus.

7. **B. epixanthoides** (Nyl.) Kullh. Apothecia testacea aut obscurata. 238.

×× Thallus sorediis destitutus.

△ Apothecia pallida.

5. **B. pallens** Kullh. Apothecia minutissima. 236.

△△ Apothecia obscurata.

8. **B. subfuscula** (Nyl.) Th. Fr. Apothecia rufescenti-variegata. Sporae tenues, crass. 0.003—0.004 mm. 240.

9. **B. Naegelii** (Hepp) Anzi. Apothecia rufescenti- vel fusciscenti-variegata. Sporae crass. 0.0045—0.006 mm. 242.

[23. **B. populorum** (Mass.) Vain. Apothecia atra. Sporae 8—16:nae. 265.]

B. Paraphyses membrana tota gelatinosa aut strato exteriore distincte gelatinoso.

I. Sporae 5-(4-)—pluri-septatae.

α. Hypothecium typice superne obscuratum.

10. **B. hypnophila** (Ach.) Th. Fr. Hypothecium superne fulvo-fuscescens aut rarius pallidum. Hymenium decoloratum aut superne fuscescens aut raro olivaceum. 244.

11. ***B. accedens** (Arn.) Th. Fr. Hypothecium superne fusco-rubricosum rufescensve. Hymenium parte superiore aeruginosum. 246.

β. Hypothecium superne pallidum decoloratumve aut dilute coloratum.

† Apothecia late adnata, haud stipitata.

○ Sporae oblongae fusiformesve.

12. **B. lignaria** (Ach.) Arn. Epithecium aeruginosum aut raro olivaceum. 247.

○○ Sporae aciculari-fusifformes.

13. **B. chlorococca** Graeve. Thallus sorediis instructus. Apothecia colore variegata, nigricantia et rufescentia aut pallido-rufescentia. 249.

14. ***B. interspersula** (Nyl.) Vain. Thallus evanescens, esorediatus. Apothecia nigricantia. 250.

†† Apothecia stipitata aut basi constricta.

15. **B. gomphillacea** (Nyl.) Vain. Apothecia disco atro aut fusconigricante, stipite vulgo pallido. 251.

[22. **B. granulans** Vain. Apothecia sessilia. Sporae vulgo 1—3-septatae, parce etiam 4—5-septatae. 265.]

II. Sporae 3-septatae.

a. Hypothecium superne obscuratum.

16. **B. melaena** (Nyl.) Arn. Apothecia atra, immarginata. 253.

b. Hypothecium superne pallidum decoloratumve aut dilute coloratum.

) Apothecia late adnata.

△ Apothecia obscurata.

× Apothecia mediocria (lat. 0.7—1.5 mm).

20. **B. atrolivida** Vain. Hymenium striis fusciscentibus. 261.

×× Apothecia minora, lat. 0.2—0.7 (—0.9) mm.

17. **B. trisepta** (Naeg.) Arn. Hymenium typice aeruginosum, KHO haud violascens. 255.

18. **B. Nitschkeana** Lahm. Epithecium sordide violascens olivaceumve, KHO pulchre violascens. 258.

△△ Apothecia p. p. albida.

19. **B. albidolivens** (Nyl.) Blomb. et Forss. Apothecia p. p. albida, p. p. nigricantia. 260.

○○ Apothecia basi constricta.

21. **B. obscurata** (Sommerf.) Th. Fr. Hypothecium hyphis irregulariter contextis. Paraphyses simplices. Gonidia cellulis vulgo diam. 0.008—0.010 mm. 262.

22. **B. granulans** Vain. Hypothecium hyphis erectis. Paraphyses ramoso-connexae. Gonidia cellulis 0.004—0.005 mm latis. 265.

Sect. 2. **Arthrospora** (Mass.) Vain. Sporae 8-nae—16-nae.

23. **B. populorum** (Mass.) Vain. Apothecia atra, vulgo subpersistenter marginata. Sporae vulgo curvatae, 3-septatae. 266.

Sect. 1. **Eubilimbia** (Th. Fr.) Vain.

Bilimbia **Eubilimbia* Th. Fr. Lich. Scand. II (1874) p. 369 (emend.).
Bilimbia De Notar. l. c.

Sporae 8:nae.

1. **B. lugubris** (Sommerf.) Th. Fr.

Lich. Scand. II (1874) p. 387. *Lecidea lugubris* Sommerf. Suppl. Fl. Lapp. (1826) p. 143 (sec. herb. Sommerf., ut indicat Th. Fr., Lich. Arct. p. 173), haud Nyl. *Toninia* Th. Fr. l. c. (1860) p. 172. *L. funerea* Sommerf. Phys.-oecon. Beskr. Saltd. (Det K. Norsk. Vid. Skr. 1826) p. 52 (sec. Th. Fr.); Vain. Adj. Lich. Lapp. II (1883) p. 13. *L. caudata* Nyl. Nya Bot. Not. 1852 p. 176, Lich. Scand. (1861) p. 230, 293, En. Lich. Fret. Behr. (1888) p. 37.

Exs. Th. Fr. Lich. Scand. Exs. I (1859) n. 18. — Fellm. Lich. Arct. (1864) p. 192. — Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 198 a, b. — Havaas Lich. Norv. Exs. (1903) n. 160.

Thallus areolatus, areolis verrucaeformibus convexisque aut verrucoso-inaequalibus aut raro planis laevigatisque, cinereis aut cinereo-fuscescentibus vel obscure cinereis aut raro albido-cinerascentibus, esorediatus. Apothecia vulgo mediocria, late adnata, demum basi leviter constricta, disco plano, atro, nudo, margine modice incrassato aut sat crasso, concolore aut obscure cinerascente, subpersistente. Hypothecium vulgo rubricosum-fuscescens. Epithecium sordide violascens fuscescensve aut raro olivaceum. Sporae clavatae aut oblongo-elongatae, apice inferiore attenuatae, „5—7-septatae, long. 0.035—0.050, crass. 0.055—0.007 mm“ (sec. Th. Fr.).

Distr. Locis apricis ventosisque in saxis declivibus rupium graniticarum, porphyricarum et gabbroiticarum locis numerosis collecta. LIn.: In reg. pinifera prope littora lacus Inarijärvi et in monte Ruoptuivaara (Vain.), in reg. subalp. montium Hammastunturit et alibi (Vain.). LPon.: Katschkofka et Triostrov (N. I. Fellman). LKern.: Kittilä (E. Nylander), in reg. subalp. montis Pyhätunturi in Sodankylä (Vain.). KKER.: In reg. subalp. montium Päänuorunen et Kivakka (Vain.). Kuus.: In reg. subalp. montium Mäntyunturi et Nuorunen (Vain.), in reg. abiet. montis

Näränkäväära (Vain.). Kb.: In montibus Riihivaara et Louhivaara in Nurmes (Vain.). Ta.: Ad Templum (Norrl., H. L. F. n. 198 a), Haukkavuori in Korpilahti (Vain. Fl. Tav. Or. p. 114), Evo (Norrl., H. L. F. n. 198 b), Tiirismaa in Hollola (Vain.). N.: Kotimäki, Mäkiinpäällys, Somerikonvuoret, Lounatpuoli Hoglandiae (Vain., „in montibus altioribus porphyricis frequens“ sec. M. Brenner Bidr. Høgl. Lafv. p. 107). Ka.: Huusniemi et Monrepos ad Viburgum (Vain. Lich. Vib. p. 62). Al.: „Sat frequens, admodum frequenter in Kasberget in Jomala et Orrdalsklint in Saltvik“ sec. E. Nylander Ålands Lafveg. p. 91).

Thallus modice incrassatus aut demum crassus (—1 mm), areolis 0.3—0.5 (—2.5) mm latis, opacus, partim tenuissime subpruinosis, vulgo hypothallo nigro tenui limitatus, „nec KHO, nec CaCl_2O_2 reagens“ (sec. annot. Nyl.), medulla jodo non reagente. Apothecia lat. 0.7—1.5 (—0.3) mm, saepe sat crebra aut aggregata, haud raro demum flexuosa lobatae, opaca, margine saepe prominente. Hypothecium parte superiore saepe dilute rubricosum, hyphis sat irregulariter contextis, sat leptodermaticis, cavitatibus variabilibus, guttulas resinosas continens. Perithecium extus rubricosco-fuscescens et intus pallidum aut in margine totum subfuscescens, sat irregulariter contextum aut in margine hyphis subradiantibus, membranis modice incrassatis, cavitatibus vulgo brevibus, circ. 0.004—0.003 mm latis, guttulas resinosas, in KHO distinctiores, continens. Hymenium circ. 0.140—0.130 mm crassum, jodo persistenter caeruleus, epithecio KHO obscurius fuscescente. Paraphyses laxae cohaerentes, crass. 0.0015 mm aut tenuiores, apice 0.003—0.004 mm, apices versus saepe septatae, haud gelatinosae. Asci clavati, long. circ. 0.055—0.060, crass. 0.015—0.020 mm. Sporae polystichae, apice superiore obtuso. Conidia „leviter cylindrica, recta, long. circ. 0.003 mm“ sec. Th. Fr. Gonidia pleurococcoidea, globosa, simplicia diam. 0.007—0.016 mm, saepe bicellulosa, membrana modice aut bene incrassata.

F. cinerascens (Nyl.) Vain. (*L. caudata* f. *cinerascens* Nyl. in Brenn. Bidr. Høgl. Lafv., 1885, p. 107). Thallus albidocinerascens albidusve, „nec KHO, nec CaCl_2O_2 reagens“ (sec. annot. Nyl.), areolatus, areolis laevigatis, hypothallo nigro distincto. Facie externa similis *Lecideae pantherinae*. — **Distr.** In rupe porphyrica supra Lounatkorkia (M. Brenner) et Somerikonvuoret (Vain.) Hoglandiae. — Epithecium et hypothecium subfuscescentia, KHO non reagentia.

Obs. *B. lugubris*, ad sect. *Urophoram* a Th. Fr. in Lich. Scand. II (1874) p. 387 ducta, a Zahlbr. in Ascol. (1905) p. 135 ad *Bacidium*

sect. III. *Ropalosporam* (Mass.) Zahlbr. (*Ropalospora* Mass. Esam. Alc. Gen., 1860, p. 19) refertur.

2. *B. trachona* (Ach.) Arn.

Lich. Fränk. Jur. (Fl. 1884) p. 181. *Verrucaria trachona* Ach. Meth. Lich. Suppl. (1803) p. 16 (conidangiis instructa sec. herb. Ach.), Lich. Univ. (1810) p. 286, Syn. Lich. (1814) p. 96. *Biatora* Flot. in Zwackh Lich. Exs. (1851) n. 104, (1852) n. 117; Koerb. Syst. Lich. Germ. (1855) p. 197. *Lecidea vernalis* var. *trachona* Nyl. Add. Fl. Chil. (1855) p. 161. *L. trachona* Nyl. Fl. 1864 p. 620; Stizenb. l. c. p. 58, tab. III G f. 1—7. *Bilimbia coprodes* Koerb. in Arn. Lich. Fränk. Jur. (Fl. 1858) p. 503, (Fl. 1884) p. 181, Lich. Tirol X (1873) p. 8 (96), Lich. Münch. (1891) p. 87; Koerb. Par. Lich. 2 Lief. (1860) p. 166; Th. Fr. Lich. Scand. II (1874) p. 385.

Exs. Zwackh Lich. Exs. (1851) n. 104, (1852) n. 117, (1883) n. 780, 870. — Arn. Lich. Exs. (1866) n. 333. — Rabenh. Lich. Eur. Exs. XXXI (1869) n. 846. — Zahlbr. Lich. Exs. VII (1901) n. 657.

Thallus verruculoso-inaequalis, esorediatus aut demum parce sorediosus. Apothecia sat parva, late adnata, primum plana marginataque, dein vulgo convexa immarginataque, atra, nuda. Epithecium partim subaeruginosum aut olivaceum. Hypothecium superne vulgo rubricosum-fuscescens. Excipulum obscuratum. Sporae vulgo oblongae aut fusiformes, apicibus obtusis, long. 0.011—0.016 mm (—0.019 sec. Stizenb.), crass. 0.003 mm (—0.005 mm sec. annot. Nyl.), demum 3-septatae.

Distr. Ad latera umbrosa saxorum et in cavernis rupium collecta. Ta.: Hersala in Hollola (conidangiis et apoth., J. P. Norrlin), Jokioinen et Arokoski in Padasjoki (conidangiis nec apoth., Vain.), Hietala in Luhanka (conidang., Vain. Fl. Tav. Or. p. 112). KLad.: Kirjavalahhti (apotheciis in latere occulto rupis calcariae, Norrl. Symb. Fl. Ladog.-Kar., 1878, p. 29).

Thallus sat tenuis aut tenuis, subcontinuum aut areolato-diffractus aut dispersus, glaucescens aut cinereo- vel albido-glaucescens, aut evanescens, hypothallo indistincto (nigricante in var. *nigricolore* Vain. in Jersey a Larbal. collecta, n. 18956 in herb. Nyl.). Apothecia lat. 0.3—0.8 mm, sparsa aut sat crebra. Hypothecium parte inferiore pallidum, chondroideum, sat pachy-

dermaticum, irregulariter contextum, tubulis tenuibus, parte superiore fuscescens vel rubricosus vel violaceo-fuscescens aut sordide vel rufescenti-pallidum (in var. *subviolacea*), hyphis sat irregulariter contextis, crebre septatis, membranis modice incrassatis. Perithecium in margine fuscescens, inferne pallidum aut decoloratum, ex hyphis radiantibus formatum, sat modice pachydermaticum, cellulis angustis, oblongis aut ellipsoideis. Hymenium 0.050—0.055 mm crassum, parte superiore aeruginosum (KHO non reagens) aut partim decoloratum (aut rufescens sec. Stizenb.), jodo persistenter caerulescens (in specim. ad Eichstätt ab Arn. lecto). Paraphyses arcte cohaerentes (in specim. Arn.), aut „sat laxae cohaerentes“ sec. Th. Fr. et Stizenb., parce septatae, crass. 0.0015 mm, apice clavatae et 0.005—0.004 mm crassae. Conidangia verrucas subhemisphaericas, 0.002—0.003 mm lata, prominentes, nigras formantia, in diversis thallis aut interdum in eodem thallo cum apotheciis provenientia. Sterigmata simplicia, long. 0.006—0.008, crass. 0.0015 mm, saepe uno septo instructa, apicibus conidia efferentibus. Conidia ellipsoidea aut oblonga, long. 0.004—0.003, crass. 0.0015 mm, apicibus rotundatis, lateribus convexis aut rarius cylindricis. Gonidia cystococcoidea, globosa, simplicia (sed saepe glomeruloso-conferta), diam. 0.006—0.012 mm, membrana modice incrassata aut sat tenui, interdum autosporis globosis aut subellipsoideo-globosis, diam. 0.003—0.0035 mm, instructa (in specim. Arn.).

F. macrescens Vain., thallo evanescente, in Kirjavalhti (Norrl.).

F. coprodes Vain., thallo distincto, ad Hersala in Hollola (Norrl.), Jokioinen et Arokoski in Padasjoki et Hietala in Luhanka (Vain.).

Obs. Var. *subviolacea* (Lång) Vain., hypothecio parte superiore sordide pallido et partim rufescenti-pallido a f. *coprode* differens, ad *B. trachonam* pertinere videtur. Paraphyses haud gelatinosae, sat laxae cohaerentes, crass. 0.0015 mm, apice clavatae et 0.003 mm crassae atque sordide subcyanescentes. Perithecium violaceo-fuscescens. „Partes obscuratae apothecii KHO non reagentes“ (sec. annot. Långii). Hymenium crass. 0.050—0.055 mm, „jodo levissime caerulescens deindeque vinose rubens“ (sec. annot. Långii). Asci clavati, long. circ. 0.052, crass. 0.010 mm. Sporae distichae, long. 0.009—0.012 mm („—0.014 mm“ sec. Lång), crass. 0.003—0.004 mm, fusiformi-oblongae, apicibus obtusis. Apothecia sat crebra, lat. 0.3—0.7 mm, late adnata, basi leviter constricta, atra, plana aut demum depresso-convexa, subpersistenter marginata. Thallus sat tenuis, subcontinuus aut dispersus, subverruculoso-inaequalis, fuscescenti-olivaceus, esorediatus. Gonidia cystococcoidea, globosa aut subglobosa, simplicia, diam. 0.007—0.016 mm, membrana modice aut interdum bene incrassata, saepe autosporas globosas, numerosas, diam.

0.004—0.006 mm, continentia. Ad saxum graniticum in Mustiala Tavastiae austr. (A. Kullhem).

3. *B. calcariella* (Nyl.) Blomb. et Forss.

Enum. Plant. Scand. (1880) p. 82. *Lecidea calcariella* Nyl. Fl. 1874 p. 311; Hue Addend. II (1888) p. 157.

Thallus verruculosus, dispersus, esorediatus. Apothecia parva, basi demum leviter constricta, demum convexa, immarginata, nigricantia. Hypothecium intense fuscescens (aut „infra dilutius“ sec. Nyl.). Hymenium parte superiore vulgo olivaceo-nigricans aut „smaragdescens“ (sec. Nyl.). Paraphyses haud gelatinosae. Sporae fusiformes, apicibus acutis aut obtusis, 3-septatae, long. 0.017—0.022, crass. 0.006—0.007 mm.

Distr. In rupe calcaria ad Ersby in Pargas in reg. Aboënsi (F. Elfving).

Habitu a *B. obscurata* var. *microcarpa* Th. Fr. vix recedit, sed ei haud affinis, paraphysibus haud gelatinosis et hypothecio superne intense fuscescente ab ea differens. Thallus tenuis, impure albidus, haud sorediosus („leproso-farinosus“ a Nyl. haud bene describitur). Apothecia lat. 0.2—0.4 mm, opaca, nuda aut raro pruinosa. Hypothecium irregulariter contextum, hyphis modice pachydermaticis. Hymenium 0.064—0.070 mm crassum, parte superiore olivaceo-aeruginosum aut olivaceo-nigricans, partim subfuscescens (KHO partes olivaceae non reagentes, partes fusciscentes hymenii et hypothecii subrubricoso-rufescentes). Paraphyses arcte cohaerentes, increbre septatae, crass. circ. 0.0015 mm, apice circ. 0.004 mm clavataeque. Asci clavati, long. 0.055, crass. 0.020 mm. Sporae distichae. Gonidia cystococcoidea, globosa aut subglobosa, simplicia, diam. 0.014—0.006 mm, membrana sat tenui, vacuolis lateralibus.

4. *B. sphaeroides* (Dicks.) Th. Fr.

Lich. Arct. (1860) p. 182, Lich. Scand. II (1874) p. 369; Koerb. Syst. Lich. Germ. (1855) p. 213 p. p. *Lichen* Dicks. Fasc. Pl. Crypt. I (1785) p. 9, tab. 2 f. 2. *Lecidea* Sommerf. Suppl. Fl. Lapp. (1826) p. 164 p. p.; Nyl. Lich. Scand. (1861) p. 204 (excl. var.), Lich. Lapp. Or. (1866) p. 150; Stizenb. Lec. Sab. (1867) p. 13 p. p.

Exs. Stenh. Lich. Suec. Exs. n. 54 B (sec. Th. Fr. l. c.). — Fellm. Lich. Arct. (1864) n. 158 (sec. Nyl. l. c.). — Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 311.

Thallus vulgo cinereo-albidus, verruculosus, raro partim solediosus. Apothecia vulgo mediocria, basi bene constricta, vulgo demum subglobosa, primum margine saepe sat crasso aut tenui, albido pallidove instructa, disco testaceo- aut carneo-pallido aut albido-carneo, haud pruinoso. Hypothecium decoloratum. Sporae vulgo oblongae obtusaeque, 3-septatae (aut raro parceque 5-septatae), long. 0.013—0.020 mm (aut raro longiores).

Distr. Supra muscos putrescentes in lateribus rupium silicosarum et calcariarum, praertim ad basim, et supra corticem et muscos ad basim truncorum Populi, Sorbi et Salicis capreae passim suisque locis etiam sat frequenter provenit, septentrionem versus rarescens, sed locis numerosis etiam in Lapponia collecta.

Thallus tenuis aut sat crassus, verruculis minutis aut usque ad 0.3 mm latis, crebris aut dispersis, interdum solediosis, KHO non reagens aut partim leviter flavescens, CaCl_2O_2 non reagens. Apothecia lat. 1—0.7 (1.2—0.2) mm, saepe p. p. tuberculosa aut tuberculato-confluenta, nec KHO nec CaCl_2O_2 reagentia, crebra aut dispersa, raro p. p. testaceo-rufescentia. Hymenium 0.060—0.070 mm crassum, jodo leviter aut levissime caerulescens deindeque vinose rubens aut ascis apice persistenter caerulescentibus. Epithecium decoloratum aut pallidum. Paraphyses sat laxe cohaerentes, crass. 0.0015—0.001 mm, apice leviter incrassatae, haud gelatinosae, in KHO laxe cohaerentes. Hypothecium in parte inferiore bene chondroideum, decoloratum, ex hyphis bene pachydermaticis, irregulariter contextis, conglutinatis formatum, tubulis tenuibus, in parte superiore pallidum aut subdecoloratum, hyphis sat erectis, modice pachydermaticis. Perithecium chondroideum, pallidum aut subdecoloratum, hyphis radiantibus, conglutinatis, pachydermaticis, tubulis tenuibus, sat increbre aut sat crebre septatis. Asci clavati, vulgo long. 0.070—0.060, crass. 0.010 mm. Sporae 8-nae, distichae, oblongae, rectae, apicibus rotundatis aut obtusis. Gonidia micareoidea, globosa et diam. 0.008—0.004 mm et p. p. ellipsoidea, vulgo glomerulosa et pariete communi gelatinoso-incrassato induta, interdum etiam bicellulosa.

Obs. 1. *F. peralbata* (Nyl.) Th. Fr. Lich. Scand. II (1874) p. 370 (*Lecidea sphaeroides* f. *peralbata* Nyl. in Stizenb. l. c. p. 15, Vain. Adj. Lich. Lapp. II, 1883, p. 7), apotheciis minoribus, 0.5—0.2 mm latis, bene convexis, saepe testaceo-pallidis aut carneo-pallidis, margine tenui, fere mox excluso, sporis 3-septatis, „long. 0.012—0.017, crass. 0.004—0.006 mm“

(sec. annot. Nyl. in herb. suo), thallo tenui, disperso. Ad corticem arborum et lignum locis numerosis lecta. — *F. minima* Vain., apotheciis 0.2—0.25 (—0.3) mm latis, fere mox bene convexis immarginatisque, stramineo-pallidis, haud pruinosis, sporis 3-septatis, long. 0.008—0.013, crass. 0.0025—0.003 mm. Ad corticem Salicis capreae prope Veskonien in reg. pinifera Lapponiae Inarensis („*L. pallens*“ in Vain. Adj. Lich. Lapp. II p. 7). Thallus et apothecia nec KHO nec CaCl_2O_2 reagentia. Hymenium crass. 0.050 mm, jodo sat dilute caerulescens, dein fulvescenti-vinose rubens. — *F. carnella* Vain., apotheciis circ. 1—0.6 mm latis, carneo-albidis et thallo magis evoluto a f. *peralbata* differens, supra muscos, cortices et lignum locis numerosis collecta. — *F. carneoalbida* (Müll. Arg.) Nyl. in herb. suo (*Patellaria carneoalbida* Müll. Arg. Fl. 1868 p. 50), sporis 3-septatis et parcius 5-septatis, „long. 0.015—0.018 (—0.027) mm, crass. 0.0045 (—0.008) mm, oblongis aut subfusiformibus“ sec. annot. Nyl. in herb. suo. Ad corticem Juniperi in Lapponia Tulomensi (N. I. Fellman, n. 18453). Sec. fragm. specim. orig. Mülleri in herb. Nyl.

Obs. 2. *Bilimbia Badensis* Koerb. Parerg. Lich. p. 168 (Zwackh Lich. Heidelb. p. 48), ad *B. sphaeroidem* a Th. Fr. relata, est autonoma species, apotheciis rufis, margine persistente, sat crasso, disco plano aut demum leviter convexo ab ea bene differens.

5. *B. pallens* Kullh.

Not. Sällsk. F. et Fl. F. Förh. XI (1871) p. 274; Th. Fr. Lich. Scand. II (1874) p. 370. *Lecidea* Vain. Fl. Tav. Or. (1878) p. 113, Adj. Lich. Lapp. II (1883) p. 7.

Thallus tenuis, verruculoso-inaequalis aut sat laevigatus, albidus, subdispersus aut sat continuus. Apothecia minuta, basi late adnata, diu leviter convexa et margine tenuissimo, demisso, albido instructa, demum bene convexa immarginataque, disco carneo-albido, tenuissime pruinoso aut demum denudato. Hypothecium decoloratum. Sporae oblongae aut elongato-oblongae, apicibus rotundatis obtusisve, 3-septatae, „long. 0.009—0.018, crass. 0.002—0.003 mm“ (sec. Kullh. in herb. suo).

Distr. Ad corticem Tiliae (A. Kullhem), Sorbi, Alni, Salicis capreae, Betulae, Pini, Abietis in abiegnis et nemoribus et silvis mixtis sat rara. Ta.: Circa Mustiala (A. Kullhem), Laaso et Upila in Hollola (Vain.). Tb.: Haukkavuori in Korpilahti (Vain.). Kb.: Koriseva et Kivivaara in Lieksa,

Lipinlahti et Nuottivaara in Nurmes (Vain. Adj. Lich. Lapp. II p. 7). OKaj.: Lentiira, Kylmäla in Kuhmo, Tauriainen in Kianta (Vain. l. c.). LIn.: Ad corticem Empetri prope Veskonniemi (Vain. l. c.).

Thallus interdum parce sorediosus, KHO leviter flavescens, addito CaCl_2O_2 distinctius lutescens. Apothecia vulgo sat crebra, lat. 0.2—0.3 (—0.4) mm. Hymenium crass. 0.040 (—0.045) mm, jodo subpersistenter beneque caerulescens. Epithecium stramineum, tenue, subgranulosum. Discus nec KHO, nec CaCl_2O_2 reagens. Paraphyses sat parcae, arcte cohaerentes, simplices, membranis haud gelatinosis, increbre septatae, crass. 0.0015 mm, apice saepe leviter incrassatae. Hypothecium stramineo-pallidum, ex hyphis irregulariter contextis, conglutinis, modice pachydermatis formatum. Sporae rectae. — Apotheciis minoribus et sporis tenuioribus, reactione jodetica hymenii et apotheciis saltem primum pruinosis a *B. sphaeroide* f. *peralbata* differt, cui proxima est.

F. nudior Vain.

Apothecia primitus tenuiter pruinosa deindeque denudata.

Distr. Ad ramos desiccatos Pini in Upila (Vain.), supra in dicata.

Hymenium crass. 0.040 mm, jodo persistenter caerulescens. Sporae 3-septatae. Gonidia cystococcoidea, globosa, simplicia, diam. 0.009—0.015 mm, vacuolis lateralibus, membranis sat tenuibus.

6. *B. rivulicola* Vain.

Lecidea rivulicola Vain. Adj. Lich. Lapp. II (1883) p. 11.

Thallus verruculoso-inaequalis, esorediatus. Apothecia parva, basi bene constricta, disco plano planiusculove, fusco rufescenteve, haud pruinoso, subpersistenter marginata, margine tenui, cinereo-pallescente aut rarius superne fuscescente. Hypothecium pallidum aut sublutescens. Hymenium pallidum aut partim dilute rufescens. Sporae oblongae aut subfusiformes, apicibus obtusis, diu 1-septatae, demum 3-septatae, long. 0.016—0.020 (—0.013), crass. 0.005—0.006 mm.

Distr. Ad saxa dioritica in rivulo prope Kiannanniemi in Kianta in OKaj. (Vain.).

B. violacea (Crouan) sec. specim. orig. n. 18716 in herb. Nyl. apotheciis late adnatis, basi haud constrictis, haud elevatis, immarginatis et thallo subalbido ab hac specie differt. *B. obscurata*, cujus var. *submuricola* habitu apotheciorum *B. rivulicolae* subsimilis est, paraphysibus gelatinosis et aliis notis internis ab ea distinguitur. — Thallus sat tenuis, continuus aut diffractus vel subdispersus, cinereo-glauescens. Apothecia sat dispersa, lat. 0.3—0.4 mm, bene prominentia, parum nitida, margine discum haud superante. Perithecium pallidum aut in summo margine intusve rufescens, ex hyphis radiantibus, leviter pachydermaticis, conglutinatissimum formatum, cavitatibus oblongis, 0.001 mm latis. Hypothecium hyphis ad latera sat verticalibus, in medio sat irregularibus, membranis modice incrassatis, cavitatibus brevibus, circ. 0.002 (0.0015—0.003) mm latis et partim parcius longioribus tenuioribusque. Paraphyses sat laxae aut sat arcte cohaerentes, parte superiore septatae, haud gelatinosae, crass. 0.001—0.0015 mm, apice 0.003—0.0035 mm clavataeque. Hymenium crass. 0.050—0.055 mm, jodo caerulescens, dein sat obscure vinose rubens (Vain. l. c.) aut persistenter caerulescens (in solutione, quam nunc adhibeo). Epithecium pallidum aut partim dilute rufescens, KHO distinctius rubricosum. Asci long. circ. 0.045, crass. 0.014—0.016 mm. Sporae 3-stichae aut distichae. Gonidia cystococcoidea, globosa, diam. 0.008—0.016 mm, vacuolis lateralibus, membrana sat tenui, auto-sporis numerosis, diam. 0.004—0.005 mm.

7. *B. epixanthoides* (Nyl.) Kullh.

Not. Sällsk. F. et Fl. Förh. XI (1871) p. 274; Th. Fr. Lich. Scand. II (1874) p. 377. *Lecidea* Nyl. Fl. 1865 p. 5, Lich. Lapp. Or. (1866) p. 183. *L. sphaeroides* f. *epixanthoides* Stizenb. Lec. Sab. (1867) p. 16.

Thallus totus aut partim farinoso-sorediosus. Apothecia sat parva aut mediocria, vulgo late adnata, fere mox convexa, primum (haud diu) sat tenuiter marginata, fusca aut nigricantia aut umbrino-rufescentia testaceave. Hypothecium subpallidum vel subdecoloratum. Sporae oblongae, apicibus obtusis rotundatisve, 3-septatae, long. 0.013—0.022, crass. 0.004—0.005 mm.

Distr. Ad corticem putridum vetustumve et muscos destructos ad basim truncorum vetustorum putridorum *Salicis capreae*, *Populi tremulae*, *Sorbi*, *Tiliae*, *Alni*, *Betulae* et raro ad muscos putridos in latere rupis crescens, sat rara

aut passim in territorio nostro. Ab.: Runsala (A. Kullhem). Ka.: Nonnullis locis ad Vanhaviipuri, Uuras (Vain. Lich. Viburg. p. 63). KOL.: Humbaritsa (Elfv. Ant. Veg. Svir p. 168). Ta.: Särkijärvi, Saukonniemi, Pähkijärvi, Mustiala (A. Kullhem), Tiirismaa, Messilä, Siikaniemi in Hollola (Vain.), Asikkala (J. P. Norrlin), Nyystölä et Kirkonkylä (Vain.), Evo (Norrl., Vain.), Kuohijoki in Luopioinen (C. Leopold). Sa.: Ad Canalem Saimae et Savonlinna (O. Carlenius). Tb.: Piililä in Korpilahti, ad Tourujoki in Jyväskylä (Vain. Fl. Tav. Or. p. 113), Pihlajavesi (Norrl., Vain.). KON.: Dianovagora (Kullh.), Perttiniemi et Jänkäjärvi (Norrl. Fl. Kar. Oneg. II p. 30). Kb.: Kalliovaara in Lieksa, Nuottivaara in Nurmes (Vain.). Kar. Vien. occ.: Tscholkka in Repola (Vain.). OKaj.: Lapinsalmi in Kuhmo, Saarikoski („*L. triplicans f. leucorhypha*“ Vain. Adj. Lich. Lapp. II p. 8), Hossa in Kianta (Vain. l. c. p. 10). Ob.: Ulaburgum (E. Nylander). Kuus.: Sirkelä ad Paanajärvi (Vain. l. c.). LKem.: Jerisjärvi in par. Muonioniska (Norrl.). LIm.: Umpjavr (A. O. Kairamo).

Thallus crassus aut tenuis, partim verruculoso-inaequalis et parce sorediosus, cinereo- aut albido-glauescens, aut fere totus soredioso-leprosus, sorediis stramineo- vel flavido-cinerascentibus. Apothecia lat. 0.3—0.8 (—1.3) mm, sparsa aut partim aggregata, interdum basi magis constricta, haud pruinosa, margine concolore aut pallidiore. Hypothecium interdum dilute fuscescens, superne hyphis sat erectis, modice pachydermatis, in parte inferiore hyphis irregulariter contextis, pachydermatis. Hymenium crass. 0.060 mm (0.050 mm sec. Stizenb.), „jodo vinose rubens“ (sec. annot. Nyl. „*caerulescentia nulla*“). Paraphyses sat arcte cohaerentes, crass. 0.001—0.0015 mm, apice sensim incrassatae (0.002—0.003 mm), haud gelatinosae. Epithecium aut hymenium fere totum dilute fuscescens (vel „*violaceo-fuscescens*“ sec. Th. Fr.) aut pallidum vel decoloratum. „KHO non mutantur v. paullo distinctius violascunt partes obscuriores“ (Th. Fr.). Asci clavati, long. 0.060, crass. 0.010—0.012 mm. Sporae distichae, sec. Nyl. long. — 0.024, sec. Th. Fr. — 0.023 mm. Gonidia micareoidea, glomerolosa, cellulis globosis, diam. 0.004—0.005 mm, aut irregulariter subellipsoideis et long. 0.007 mm, pariete communi gelatinoso-incrassato, hyphis obducto 0.003 mm crassis, crebre septatis, leptodermatis.

Var. *microbola* (Nyl.) Vain. *Lecidea sphaeroides* f. *microbola* Nyl. in Stizenb. Lec. Sabul. (1867) p. 15, Norrl. Ber. Torn. Lappm. (1876) p. 336 (in herb. Nyl.).

Apothecia rufescentia aut testaceo-rufescentia. Thallus partim solediosus.

Distr. Vanhaviipuri (Vain.), Parinpelto in Hollola („*L. sphaer.* v. *versatilis*“ sec. Nyl. in Norrl. Bidr. Sydöstr. Tav. Fl. p. 188), Kirkonkylä in Padasjoki (Vain.), Evo (Norrl.), Perttiniemi (Norrl.), Nuottivaara in Nurmes („f. *versatilis*“ Vain. Adj. Lich. Lapp. II p. 11), Jerisjärvi in Muonioniska (Norrl.), loca supra indicata.

Fere est subspecies, intermedia inter *B. epixanthoidem* et *B. sphaeroidem*, sed in priorem saepe transit, in eodem specimine etiam apotheciis obscuratis instructa. — *Lecidea microbola* Ach., Syn. Lich. (1814) p. 48, ad *L. globosam* Clem. spectans, herbario Ach. deest, nec exactius cognita. In herb. Nyl. non reperiens „f. *microbolam* Nyl.“, ad corticem Betulae prope Kuolla in Lapponia a Karsten lectam, a Stizenb. commemoratam, sec. specim. Norrlinianum hanc varietatem determinavi.

Obs. *B. epixanthoides* f. *versatilis* (Nyl.) Vain. (*L. sphaeroides* f. *versatilis* Nyl. in Stizenb. Lec. Sab., 1867, p. 16) sec. specim. orig. ad Dianovagora in Karelia a Kullh. lectum (n. 18632 in herb. Nyl.) thallo tenui, passim parce (distincte) soledioso a f. *normali* (Vain. Adj. Lich. Lapp. II p. 10) hujus speciei differt et in eodem specimine orig. apotheciis fusciscentibus et parcius rufescentibus atque testaceis instructa est. Haec forma collecta est etiam in Evo (Vain.), ad Särkijärvi et Pähkijärvi in Tammela (A. Kullhem), Canalem Saimae (O. Carlenius), Tscholkka in Repola (Vain.), Jerisjärvi in Lapponia (Norrl.).

8. *B. subfuscula* (Nyl.) Th. Fr.

Lich. Scand. II (1874) p. 378. *Lecidea subfuscula* Nyl. Fl. 1865 p. 604. *Bacidia* Th. Fr. Lich. Spitsb. (K. Sv. Vet. Ak. Handl. 7, 1867) p. 35. *Lecidea sabuletorum* f. *venusta* (Hepp) Stizenb. Lec. Sab. (1867) p. 37. *L. leucococcoides* Nyl. Fl. 1869 p. 296 (conf. infra).

Thallus modice incrassatus aut raro tenuis, verrucosus aut rarius verruculosus, verrucis connatis aut raro dispersis, impure albescens aut albido-pallescentis, esorediatus. Apothecia vulgo sat parva, primum thallo immersa, demum basi tota adnata, disco fusciscente rufescenteve aut testaceo-rufescenti- vel testaceo- aut nigricanti-variegato, plano aut vulgo demum depresso-convexo aut raro bene convexo, primum margine concolore pallidioreve, tenui cincta, demum

immarginata. Hypothecium decoloratum et parte superiore pallidum. Hymenium parte superiore subviolaceo-fuscescens (aut decoloratum in apotheciis pallidioribus sec. Stizenb.), KHO non reagens. Perithecium pallidum. Sporae anguste fusiformes, „long. 0.018—0.026, crass. 0.003—0.004 mm“ (sec. annot. Nyl.), vulgo 3-septatae, raro pluri-septatae (sec. Th. Fr. cet.).

Distr. Ad muscos et cortices lignaque vetusta et terram turfosam arenosamque crescit. Var. *venusta* (L. subfuscula Nyl.) in territorio nostro nondum collecta.

Apothecia lat. 0.3—0.7 mm, crebra, opaca, nuda. Perithecium 0.060—0.080 mm crassum, „modo margine saepe paullum fuscoviolaceum“ (sec. Th. Fr.), hyphis radiantibus, conglutinated, membranis modice incrassatis, cavitatibus vulgo ellipsoideis, 0.003 mm crassis. Hypothecium irregulariter contextum, parte inferiore pachydermaticum, parte superiore sat leptodermaticum et crebrerrime contextum, pallidum et in KHO dilutissime subviolaceum. Hymenium 0.055—0.060 mm crassum, jodo intense persistenter caerulescens (in specim. orig. v. *venustae* ex Islandia, etiam sec. Stizenb.) aut demum vinose rubens (sec. Th. Fr. et Nyl., praesertim in v. *leucococcoide*). Epithecium KHO non reagens („partes obscuriores apoth. distinctius in violaceum vergunt“ sec. Th. Fr.). Paraphyses sat arcte cohaerentes (in KHO laxius), simplices, crass. 0.0015 mm, apice 0.003—0.005 mm, haud gelatinosae. Sporae partim sat similes sporis *Bacidiarum*, interdum etiam „5-septatae“ (et in „*L. leucococcoide*“ Nyl. 3—7-septatae sec. Nyl.), „long. 0.015—0.021 mm“ (sec. Th. Fr.), verisimiliter polystichae. Conidangia (pycnidia) in specim. orig. *B. subfusculae* thallo immersa, puncto nigro indicata, vertice subviolaceo-fuscescente (colore sicut in epithecio), ceterum albida. Sterigmata long. 0.006—0.010, crass. 0.002 mm, pauci-septata, apicibus stylosporas efferentibus. Stylospora (macroconidia), aciculares, vulgo subrectae, decolores, 3—2—1-septatae aut simplices, altero apice obtuso, altero attenuato, long. 0.050—0.036 (raro — 0.025) mm, crass. 0.0015 aut vix 0.002 mm (abundanter visae, nec dubiosae). Gonidia cystococcoidea, subglobosa, tantum simplicia visa, diam. 0.012—0.008—0.004 mm, membrana sat tenui.

Var. *leucococcoides* (Nyl.) Vain. *Lecidea leucococcoides* Nyl. Fl. 1869 p. 296; Fl. Dan. tab. 2878 f. 2 (sec. Th. Fr. Lich. Scand. II p. 378).

In specim. orig. n. 17415 in herb. Nyl. thallus albidus, verruculis crebris subcontiguivse, elevatis, fere isidioideis, apothecia (parcissima) „sordide testacea vel lurido-testacea vel fusciscentia, lat. 0.5—0.7 mm, convexiuscula vel convexa, immarginata, intus incoloria, sporae fusiformes, 3—7-septatae, long. 0.019—0.026, crass. 0.003 mm, paraphyses crassiusculae, epithecium et hypothecium incoloria, gelatina hymenialis jodo vinose rubens vel vinose fulvescens (praecedente quadam caerulescentia“ (sec. specim. ad Berufjord Islandiae collecta).

Distr. Haec variatio ad terram arenosam muscosamque ad Gubnoj prope Orlov in LPon. ab A. O. Kairamo lecta est (Kihlm. Neue Beitr. Flecht. Kola p. 57).

Obs. Forma, „crusta tenuissima, disperse granulosa“ (verruculosa) praedita, ad Vardoe in Norvegia collecta, in Th. Fr. l. c. commemoratur. — Var. **venusta** (Hepp) Vain. („*L. subfuscula*“ Nyl.) thallo e verrucis latioribus connatis formato a var. *leucococcoide* differt, sed in eam transire videtur.

9. *B. Naegelii* (Hepp) Anzi

Lich. Venet. (1863) n. 58; Th. Fr. Lich. Scand. II (1874) p. 378; Arn. Lich. Münch. (1891) p. 84. *Lecidea Naegelii* Hepp Syst. Samml. XVII (1852) n. 221; Stizenb. Lec. Sab. (1867) p. 19; Nyl. Lich. Paris (1896) p. 82. *Bilimbia faginea* Koerb. Syst. Lich. Germ. (1855) p. 212. *B. aparallacta* Mass. Framm. Lich. (1855) p. 21, Symm. Lich. (1855) p. 43. *B. Vallis-Tellinae* Anzi Cat. Lich. Sondr. (1860) p. 73. (Syn. sec. Stizenb.)

Exs. Zwackh Lich. Exs. (1851) n. 87 A, B sup., (1861) n. 396. — Hepp Syst. Samml. (1852) n. 221, Flecht. Eur. I (1853) n. 19. — Rabenh. Lich. Eur. Exs. XIX (1861) n. 530, 535, 536, XXII (1861) n. 602. — Arn. Lich. Exs. (1874) n. 600. (Sec. Arn. Lich. Fränk. Jur. p. 176.) — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 720, 721.

Thallus vulgo subverruculoso-inaequalis aut verrucosorugosus aut subareolatus, esorediatus. Apothecia sat parva, late adnata, disco primum plano, demum depresso-convexo aut bene convexo, colore variegato, rufescente fuscove aut nigricante aut testaceo-rufescente, margine saepe pallidiore, sat tenui, vulgo diu persistente. Hypothecium decoloratum. Sporae oblongae aut fusiformes, apicibus obtusis, 3-septatae aut fortuito 4—7-septatae, long. 0.015—0.020 (—0.028), crass. 0.0045—0.006 mm.

Distr. Ad corticem Populi et Sorbi, rarius Salicis capreae, Alni, Coryli, Pini, Syringae locis apricis vel sub-apricis sat frequenter aut passim in provinciis australibus et mediis, septentrionem versus rarescens. Tb.: Lohikoski in Jyväskylä (Vain. Fl. Tav. Or. p. 113). Ta.: Päiväkunta in Korpilahti, Kesäin in Luhanka (Vain. l. c.), Evo, Asikkala, pluribus locis in Hollola (Vain.), Tammela et Loimijoki (A. Kullhem). Locis numerosis in Nylandia, nonnullis locis ad Viburgum (Vain. Lich. Vib. p. 63), ad Perttiniemi in KOn. (Norrl. Symb. Fl. Kar. II p. 31).

Thallus tenuis aut sat tenuis, dispersus aut subcontinuus, interdum parum inaequalis, albidus aut cinereo-albicans, nec KHO nec CaCl_2O_2 reagens, hypothallo indistincto aut (in f. *hypomela*) caeruleo-nigricante. Apothecia lat. 0.3—0.4 (0.25—0.8) mm, saepe crebra, interdum tuberculata. Hymenium crass. 0.050—0.060 mm, jodo „caerulescens, dein obscuratum“ (sec. annot. Nyl.) vel „plus minus sordide fulvescens rubescensve“ (sec. Th. Fr.), persistenter caerulescens solutione mea. Pars superior hymenii striatim fuscescens aut violaceo-fuscescens, „KHO insigniore modo non mutata“ (Th. Fr.), HNO_3 violascens (sec. Nyl. in Norrl. l. c.). Paraphyses arcte cohaerentes, haud gelatinosae, crass. 0.0015 mm aut tenuiores (apice 0.003 mm), increbre septatae. Hypothecium parte superiore angusta subplectenparenchymaticum, vix pachydermaticum, cellulis parvis, anguloso-rotundatis, irregulariter dispositis, parte inferiore chondroideum, pachydermaticum, irregulariter contextum, tubulis angustis. Conidia „arcuata, long. 0.011—0.015, crass. 0.0005 mm“ sec. Nyl. Lich. Paris p. 82, „recta vel rectiuscula, elongato- vel cylindrico-oblonga, long. 0.006—0.010, crass. 0.0015—0.002 mm“ sec. Th. Fr. l. c. (Stizenb. l. c. p. 22), forsan ambarum formarum. Gonidia cystococcoidea, globosa, diam. 0.008—0.012 (—0.016) mm, simplicia, vacuolis lateralibus, chromatophoro centrali, anguloso, membrana sat tenui, interdum autosporas continentia numerosas, globosas, diam. 0.005—0.006 mm.

F. vacillans Vain. (Norrl. et Nyl. Herb. Lich. Fenn. cont., 1921, n. 720, *Lecidea sphaeroides* f. *vacillans* Nyl. Lich. Scand., 1861, p. 204, Prodr. Nov.-Granat. Lich. ed. 2, 1864, p. 58), apotheciis circ. 0.2 mm latis differens, ad corticem Syringae vulgaris in Uusikartano in Hollola (Norrl.). In Hampe Exs. n. 39, a Nyl. citato, apothecia pallidiora (rufescentia) et diu plana marginataque, sporae 3-septatae. Specim. ad Salam in Suecia collecta, apotheciis 0.5—0.3 mm latis, rufescentibus instructa, item a Nyl. citata sunt.

F. cyanomela (Nyl.) Vain. (*L. Naegelii* f. *cyanomela* Nyl. in Vain. Lich. Vib., 1878, p. 63). Thallus supra hypothallum caeruleo-nigricantem dispersus. Ad corticem Pini in Tali prope Helsingforsiam (Norrl.), ad corticem Sorbi prope Hietala Viburgi (Vain. l. c.), ad corticem Alni prope Tuomisjoja in Asikkala (Vain.) et ad Evo (Norrl.).

Obs. *L. sphaeroides* var. *leucococca* (Nyl.) Stizenb. Lec. Sab. (1867) p. 18 (*L. sphaeroides* **leucococca* Nyl. in sched.), a Th. Fr. l. c. p. 379 perperam ad *B. Naegelii* relata, sec. specim. orig. in herb. Nyl. apotheciis nigricantibus, partim latere cinereo-rufescentibus, convexis, immarginatis, opacis, 0.3—0.5 mm latis, thallo granuloso verruculosoque, disperso, cinereo-albido, sporis long. „0.016—0.023, crass. 0.004—0.005 mm, 3-septatis“ (sec. annot. Nyl.), instructa est. Lignicola ad Evo in Ta. (Norrl.). Videas p. 257.

10. **B. hypnophila** (Ach.) Th. Fr.

Lich. Aret. (1860) p. 183, Lich. Scand. II (1874) p. 373. *Lecidea hypnophila* Ach. Lich. Univ. (1810) p. 199. *L. sabuletorum* Floerk. Berl. Magaz. 1808 p. 309 [sec. Nyl. Lich. Scand. p. 204, Lich. Pyr. Or. (1891) p. 81]; Stizenb. Lec. Sab. (1867) p. 28 (excl. var.); Nyl. Lich. Paris (1896) p. 81. *Bilimbia sabuletorum* Arn. Lich. Fränk. Jur. (Fl. 1884) p. 177, Lich. Münch. (1891) p. 85. *Lichen sabuletorum* Schreb. Spic. Fl. Lips. (1771) p. 134 (exactius haud cognitus).

Exs. Schaer. Lich. Helv. Exs. IX (1833) n. 209. — Leight. Lich. Brit. Exs. III (1852) n. 91. — Zwackh Lich. Exs. (1853) n. 193. — Hepp Flecht. Eur. (1853) n. 138. — Arn. Lich. Exs. (1865) n. 295. — Rabenh. Lich. Eur. Exs. XIX (1861) n. 534. (Sec. Arn. l. c.)

Thallus verruculoso-inaequalis, esorediatus. Apothecia sat parva, late adnata, demum convexa, nigra aut fuscescentia aut rarius rufescentia vel pallidiora, margine tenui, demum excluso. Hymenium decoloratum aut parte superiore fuscescens olivaceumve. Hypothecium parte superiore fulvo-fuscescens aut rarius pallidum. Asci clavati, distichi. Sporae fusiformes, apicibus obtusis aut sat acutis, 5—7-septatae, long. vulgo 0.022—0.032, crass. 0.0045—0.007 mm („long. 0.020—0.040, crass. 0.005—0.008 mm“ sec. Stizenb. l. c.).

Distr. Supra muscos et alias plantas destructas in lateribus rupium, praesertim calcariarum, et truncis arborum insidentes, et in ipso cortice rupeque crescit, sat rare aut passim toto territorio proveniens. LIn.: Ad Köngäs prope Mare Glaciale (Vain. Adj. Lich. Lapp. II p. 9). LKem.:

Huukki (J. P. Norrlin). Kuus.: Ad Mäntyjoki prope Paana-järvi (Vain. l. c.).

Thallus vulgo tenuis, saepe fere evanescens, raro sat crassus, cinereo-glauescens aut albidus. Apothecia lat. 0.5—0.6 (0.35—0.8) mm, vulgo sat crebra. Hymenium crass. 0.100 mm (—0.080 mm sec. Stizenb.), decoloratum aut superne fuscescens aut raro partim dilute olivaceum, jodo (sec. Th. Fr. l. c.) caerulescens, dein violacee obscuratum vel subvinose rubescens fulvescensve. Hypothecium parte inferiore pallidum decoloratumve, chondroideum, pachydermaticum, hyphis irregulariter contextis, tubulis tenuibus, in parte superiore plectenparenchymaticum, leviter pachydermaticum aut sat leptodermaticum, cellulis anguloso-subglobosis, diam. 0.004—0.003 mm, in seriebus subverticalibus et sat irregulariter dispositis. Perithecium pallidum, hyphis radiantibus, conglutinatis, sat pachydermaticis, cavitatibus 0.002 mm latis, oblongis. Paraphyses arcte cohaerentes, simplices, membranis sat modice incrassatis, cavitatibus oblongis, circ. 0.0015 mm latis, apicalibus 0.003—0.004 mm latis. Asci crass. 0.012—0.016 (—0.018) mm. Sporae distichae. Gonidia globosa, simplicia, cystococcoidea, diam. 0.006—0.015 mm. Sporae vulgo rectae, vulgo 5-septatae. „Conidangia fere immersa; sterigmata simplicia, brevita; conidia subcylindrica, recta, long. 0.006—0.009 mm“ (Flag. Fl. Lich. Franch.-Comt. II, 1886, p. 364).

F. crustifera Vain. *L. hypnophila* f. *crustifera* Vain. Adj. Lich. Lapp. II p. 9.

Thallus sat crassus, cinerascenti-albido-glauescens, verruculis contiguus.

Dist. Supra muscos destructos in rupe loco calcario in reg. betulina ad Königs prope Mare Glaciale (Vain.).

Apothecia lat. 0.5—0.7 (0.8) mm, fere mox convexa immarginataque, vulgo nigra. Hypothecium fulvo-fuscescens aut pallidum. Sporae 3—5-septatae.

F. atrior (Stizenb.) Th. Fr. Lich. Scand. II (1874) p. 375. *L. sabuletorum* f. *atrior* Stizenb. l. c. p. 31. *L. dolosa* Fr. Lich. Suec. Exs. VIII (1826) n. 217 sec. Th. Fr. (haud Ach. Meth. Lich. Suppl., 1803, p. 11).

Thallus tenuissimus. Apothecia diutius plana marginataque, nigra. Hypothecium sordide luteo-fuscescens („intensiv rothbraun“ sec. Stizenb.). Hymenium, praesertim superne, olivaceum aut olivaceo-fuscescens. Sporae 5-septatae (—7-septatae sec. Stizenb.).

Dist. Ad terram in rupe prope Saarikoski in Kianta (Vain. l. c.) in KKaj., in Padasjoki (J. P. Norrlin) in Ta., ad Skräbböle in Pargas (F. Elfving) in Ab.

F. ludens (Nyl.) Th. Fr. l. c. *L. sabuletorum* f. *ludens* Nyl. in Stizenb. l. c. p. 31.

Apothecia colore in eodem specimine variegata, livido-rufescentia aut cinereo-fuscescentia aut cinereo-carnea.

Distr. N.: In rupe calcaria prope Juvas in Sibbo (Vain.). Ka.: Supra muscos in rupe ad Monrepos Viburgi (Vain.). Ab.: Supra muscos prope Templum in Vihti (A. Kullhem). KOL.: Supra muscos ad truncum Aceris in Schtjeliki (F. Elfving). Ta.: Ad cimentum murorum in Tammela (Kullh.), supra muscos et corticem ad basim trunci Tiliae in Kirkonkylä in Padasjoki (Vain.).

Thallus modice incrassatus aut tenuis. Hypothecium subrufescens aut fulvo-rufescens. Hymenium decoloratum, crass. 0.100 mm. Perithecium hyphis pachydermaticis, tubulis tenuibus, in margine saepe rufescens, ceterum pallidum. Sporae long. 0.022—0.041, crass. 0.0055—0.006 (—0.007) mm. — Huc etiam pertinet „*Biatora muscorum*“ Hepp Flecht. Eur. n. 138 (in herb. meo).

Obs. *Lecidea sabuletorum* f. *subsphaeroides* Nyl. (in Stizenb. Lec. Sabul., 1867, p. 32), sec. specim. orig. n. 18561 a e St. Cloud Parisiis apotheciis testaceis et sporis 5—7-septatis et specim. e Suecia apotheciis rufis vel testaceo-rufescentibus instructa, in Nyl. Lich. Paris (1896) p. 82, nominatur *L. sabuletorum* **L. sphaeroidiza* Nyl. („male *subsphaeroides*“ Nyl. annotavit). *L. subsphaeroides* Nyl. (Fl. 1873 p. 294), sporis 1-septatis descripta, est diversa species.

11. **B. accedens* (Arn.) Th. Fr.

Lich. Scand. II (1874) p. 375. *Bilimbia accedens* Arn. Fl. 1862 p. 391 (conf. Nyl. Fl. 1862 p. 464), Lich. Exs. (1863) n. 233, Lich. Fränk. Jur. (Fl. 1884) p. 178, Lich. Münch. (1891) p. 85. *B. decedens* Hepp in Koerb. Par. Lich. (1865) p. 163. *Lecidea sabuletorum* var. *decedens* Stizenb. Lec. Sab. (1867) p. 43. *L. hypnophila* **L. decedens* Vain. Adj. Lich. Lapp. II (1883) p. 9.

Thallus esorediatus. Apothecia sat parva, sat late adnata, demum convexa, nigra aut fusco-nigra, margine tenui, demum excluso. Hypothecium parte superiore fusco-rubricosum rufescensve. Hymenium parte superiore aeruginosum. Asci late clavati, polystichi. Sporae fusiformes, apicibus sat acutis aut obtusis, septis numerosis, circ. 5—9 (—15 sec. Stizenb.), long. circ. 0.032—0.042 mm (—0.075 mm sec. Stizenb.), crass. circ. 0.006—0.007 mm (0.005—0.009 mm sec. Th. Fr.).

Distr. Supra muscos in rupe in Karelia Onegensi (A. Kullhem). Supra muscos in rupe calcaria in reg. abietina ad Paanajärvi in Kuus. (Vain.).

Pluribus notis inconstantibus a *B. hypnophila* differt. Thallus vulgo tenuissimus, albidus cinerascens, interdum modice in-crassatus et verruculoso-inaequalis. Apothecia lat. 0.3—0.7 mm. Hypothecium parte inferiore passim pallidum, chondroideum, pachydermaticum, hyphis irregulariter contextis, tubulis tenuibus, parte superiore plectenparenchymaticum, sat leptodermaticum, cellulis anguloso-subglobosis, diam. 0.004—0.003 mm, in seriebus subverticalibus et sat irregulariter dispositis. Perithecium pallidum, hyphis radiantibus, conglutinatis, leviter pachydermatis, cavitatibus 0.002—0.0015 mm latis, oblongis. Hymenium crass. 0.094—0.110 mm, jodo intense caerulescens deindeque vinose rubens. Paraphyses arcte cohaerentes, simplices, tubulis tenuibus, membranis gelatinosis. Asci crass. circ. 0.022 mm. Sporae polystichae. Gonidia (in specim. Arn.) globosa, simplicia, cystococcoidea, diam. 0.008—0.010 mm, membrana sat tenui.

12. *B. lignaria* (Ach.) Arn.

Lich. Fränk. Jur. (Fl. 1884) p. 178, Lich. Münch. (1891) p. 86 (haud Mass. Rich. Lich. Crost. p. 121). *Lecidea lignaria* Ach. Vet. Ak. Handl. 1808 p. 236 (sec. specim. orig.), Lich. Univ. (1810) p. 169, Syn. Lich. (1814) p. 26; Vain. Adj. Lich. Lapp. II (1883) p. 11. *L. milliaria* c. *lignaria* Fr. Summ. Veg. Scand. (1846) p. 114 (sec. Th. Fr.). *Bilimbia* Th. Fr. Lich. Scand. II (1874) p. 382. *Micarea ligniaria* Hedl. Krit. Bem. Lec. Micar. (1892) p. 93. *Lecidea milliaria* Fr. Lich. Suec. Exs. (1818) p. 29 et Vet. Ak. Handl. 1822 p. 255 (sec. Th. Fr. l. c.); Nyl. Lich. Paris (1896) p. 82. *L. sabuletorum* var. *miliaria* Stizenb. Lec. Sab. (1867) p. 44.

Exs. Fr. Lich. Suec. Exs. (1818) n. 29. — Zwackh Lich. Exs. (1852) n. 121. — Rabenh. Lich. Eur. Exs. XI (1857) n. 322, XXII (1861) n. 603. — Arn. Lich. Exs. (1867) n. 348 a, b. (Sec. Arn.) — Lojka Lich. Hung. Exs. II (1882) n. 61.

Thallus verruculosus et parce verrucosus, esorediatus. Apothecia parva, haud stipitata, late adnata, subglobosa aut hemisphaerica, primum depresso-convexa, immarginata, atra aut aeruginoso-atra, nuda. Hymenium totum aut epithecium aeruginosum aut raro olivaceum. Hypothecium vulgo sordide pallidum aut dilute subfuscescenti-pallidum aut decoratum. Sporae oblongae aut fusiformes, apicibus vulgo

obtusis, demum 5--7-septatae, long. 0.020—0.030 mm (0.016—„0.032—0.040 mm“ sec. Stizenb.), crass. 0.005—0.006 mm (0.004—„0.007 mm“ sec. Stizenb.).

Distr. Supra muscos, praesertim destructos (Andreaea petrophila, Gymnomitrium concinnatum etc.) in lateribus rupium (et ad lignum putridum) crescit. Ab.: Bemby in Korpo (F. Elfving). N.: Ruokolahenjärvenmäki Hoglandiae (sec. Brenner. Bidr. Hogl. Lafv., 1885, p. 91), Tölö Helsingforsiae (Vain.). Ta.: Lapinkallio (Norrl. Bidr. Sydöstr. Tav. Fl. p. 188) et alibi in Evo (Vain.). Kb.: Riihivaara in Nurmes (Vain.). Kuus.: In reg. subalpina montis Mäntytunturi (Vain.). LEnont.: In monte ad Kilpisjärvi (Norrl. Ber. Torn. Lappm., 1873, p. 336). LIn.: In regione pinifera ad Veskonniemi (Vain. l. c.), Muddusjärvi (F. Silén). LPon.: Ponoï (N. I. Fellman, Nyl. Lich. Lapp. Or. p. 151).

Thallus sat tenuis, albidus aut cinerascens aut raro obscuratus, verruculis dispersis aut contiguïs aut supra hypothallum albidum aut partim caerulescentem inspersus. Apothecia lat. 0.4—0.5 (0.3—0.6) mm, saepe irregulariter aggregata, interdum confluentia. Hypothecium in parte superiore hyphis erectis, conglutinatîs, sat pachydermaticis, cavitatibus angustis, brevibus, interdum parte superiore dilute aeruginosum, parte inferiore irregulariter contextum, tubulis longioribus. Perithecium dilute subviolascens, partim sordide pallidum, hyphis radiantibus, sat modice pachydermaticis, conglutinatîs, tubulis tenuibus. Epithecium KHO parum reagens aut subolivaceum. Hymenium crass. 0.060—0.070 mm (—0.080 mm sec. Stizenb.), jodo caerulescens (asci „jodo persistunt caerulescentes vel solum obscurantur“ sec. Nyl. Fl. 1877 p. 232). Paraphyses arcte cohaerentes, apicibus leviter clavatis, simplices et passim parcissimeve ramoso-connexae, membranis in KHO gelatinoso-turgescentibus. Asci clavati, long. circ. 0.060 mm, crass. 0.024—0.017 mm. Sporae vulgo polystichae (—tristichae). Gonidia pleurococcoidea, saepe 2—pluri-cellulosa, saepe demum glomerulosa, simplicia globosa et diam. 0.004—0.007 mm, membrana sat tenui aut modice incrassata, haud gelatinosa.

F. nigrata (Nyl.) A. Sm. Mon. Brit. Lich. II (1911) p. 145 (*L. sabuletorum* var. *milliaria* f. *nigrata* Nyl. Lich. Lapp. Or., 1866, p. 151), thallo verruculis parvis cinereo-obscuratis supra substratum nigricans putridum crescente differens, ad muscos putridos prope Ponoï in Lapponia

collecta est (N. I. Fellman). Sporae „3—7-septatae, long. 0.030—0.040, crass. 0.007 mm“ sec. annot. Nyl.

Obs. *Lecidea submilliaria* Nyl. (Fl. 1869 p. 410) f. *nigratae* est proxima et erronee ad **B. accedentem* Arn. a Th. Fr. l. c. p. 375 relata est, textura hypothecii, paraphysibus et gonidiis ab ea differens. Thallus verrucis parvis, subfuscescentibus, parvis, ceterum evanescens et substrato putrido, obscurato immixtus. Apothecia crebra, partim contigua, globosa, immarginata, nigra, opaca, nuda (omnino perperam „sordide pallescentia vel pallido-obscurata aut nigricantia, demum caesio-suffusa“ a Nyl. descripta sunt, forsan tunc pulvere foedata). Hypothecium dilute fuscescenti-pallidum, ex hyphis erectis formatum. Hymenium jodo persistenter caerulescens (praesertim asci tincti), 0.080 mm crassum. Epithecium olivaceum. Paraphyses arcte cohaerentes, simplices et passim parce distincte ramoso-connexae, tubulis 0.001 mm crassis, apice haud incrassatis, membrana gelatinosa, in KHO turgescente. Sporae polystichae, fusiformi-oblongae elongatae, apicibus obtusis, 7- (raro — 9-)septatae, long. 0.026—0.039, „0.050—0.030“ mm sec. Nyl., crass. 0.006,,—0.007“ mm sec. Nyl. Ad terram humosam et plantas destructas in Leutsuvaara prope Kilpisjärvi in Lapponia (Norrl. Ber. Torn. Lappm. p. 337, sec. specim. orig. in herb. Nyl. et mus. Fenn.).

13. *B. chlorococca* Graewe

sec. Th. Fr. Lich. Scand. II (1874) p. 380; Arn. Zur Lich. Münch. (1897) p. 26. *Biatora hypnophila* β. *chlorococca* Graewe Vet. Ak. Förh. 1862 p. 473; Stenh. Lich. Suec. Exs. (1863) n. 170. *Lecidea chlorococca* Stizenb. Lec. Sab. (1867) p. 24.

Exs. Stenh. Lich. Suec. Exs. VI (1863) n. 170. — Larbal. Lich. Herb. IX (1881) n. 351. — Arn. Lich. Exs. (1895) n. 1660, Lich. Monac. Exs. (1895) n. 405, 406. — Zahlbr. Krypt. Exs. VIII (1902) n. 752.

Thallus sat tenuis aut modice incrassatus, verruculoso-inaequalis, partim sorediosus, cinereo-glauescens aut obscure viridulus, sorediis saepe sordide flavescentibus. Apothecia minuta, late adnata, depresso-hemisphaerica, immarginata, nigricantia et saepe rufescentia aut pallido-rufescentia. Epithecium dilute violaceo-rufescens, in apotheciis nigris simul hymenium superius interdum caeruleo-aeruginosum, KHO dilute subolivaceum aut dilute subviolascens. Hypothecium lutescenti-pallidum. Sporae aciculari-fusiformes, 3—7-septatae, long. 0.024—0.034 mm („0.016—0.040 mm“ sec. Stizenb.), crass. 0.003—0.004 mm („—0.006 mm“ sec. Stizenb.).

Distr. Ad corticem (praesertimque ramorum desiccatorum Pini sylvestris), etiam Populi, Betulae, Alni, Quercus, Sorbi collecta est. Ad corticem rami desiccati Sorbi prope Selkäpajanlahti Hoglandiae (M. Brenner, „*L. interspersula* f. thallo olivaceo-nigrescente“).

Apothecia crebra aut sat crebra, lat. 0.2—0.3 mm, saepe subnitida. Hypothecium hyphis subverticalibus, modice pachydermatis, cellulis minutis. Hymenium 0.050—0.060 mm crassum, jodo persistenter caerulescens (dein sordide vinose rubens violascentisve sec. Th. Fr.). Epithecium in apotheciis rufescentibus rubricosum-rufescens. Perithecium rubricosum aut decoloratum aut in apotheciis nigris interdum aeruginosum, hyphis sat pachydermatis, tubulis tenuibus. Paraphyses arcte cohaerentes, parce ramosae et ramoso-connexae, gelatinam sat abundantem, in KHO turgescentem, percurrentes, 0.001 (—0.0015) mm crassae (in specim. Fennico tantum simplices vidi). Asci late clavati, long. 0.030—0.040, crass. 0.015—0.020 mm, polystichi. Sporae rectae aut leviter curvatae, altero apice vulgo obtuso rotundato, altero sat attenuato, sec. Stizenb. „raro 11-septatae“. Gonidia irregulariter subglobosa, diam. 0.010—0.016 mm, saepe glomerulosa, flavescens, vacuolis lateralibus, membranis crassis, interdum etiam sat tenuibus.

Obs. „*L. interspersula* f. thallo olivaceo-nigrescente tenui determinato“, a Nyl. indicata in Brenner Bidr. Hogl. Lafv. p. 95, thallo hyphis alienis, olivaceo-nigricantibus, crebre septatis, capnodioidis obducto et gonidia continente pachydermatica, glomerulosa, flavescens, cellulis diam. 0.010—0.014 mm, epithecio tenui, dilute violascente, et simul hymenio ceterum majore parte aeruginoso, sporis 0.024—0.034 mm longis et 0.003 mm crassis instructa, est forma intermedia inter *B. chlorococcum* et **B. interspersulam* et nominetur f. *nigrescens* Vain., quae hymenio magis aeruginoso et thallo esorediato (saltem in specimine parvo hucusque lecto) a *B. chlorococco* differt.

14. **B. interspersula* (Nyl.) Vain.

Lecidea interspersula Nyl. in Brenner Bidr. Hogl. Lafv. (Meddel. Soc. F. et Fl. Fenn. XII, 1885) p. 94 p. p. (excl. „f. thallo olivaceo-nigrescente“).

Thallus evanescens, macula albida indicatus, laevigatus, sorediis destitutus. Apothecia minuta, late adnata, depresso-hemisphaerica, immarginata, nigricantia, nuda. Epithecium intense aeruginosum (aut in eodem apothecio partim stra-

mineo-pallidum), KHO sordide violascens. Hypothecium lutescenti-pallidum. Sporae aciculari-fusiformes, 3—7-septatae, long. 0.021—0.034, crass. 0.0035—0.0045 mm.

Distr. Ad corticem Pini prope Pohjoiskallio Hoglandiae (M. Brenner).

Facie externa *Bilimbiam Nitschkeanam* et *Bacidiam minusculam* Anzi (*L. stenosporam* Nyl.) in memoriam revocans. „Revera est subspecies vel varietas *L. chlorococcae* Graewe“ ex opinione Nyl. (l. c.), sed colore epithecii et thallo nec verruculoso nec soredioso et apotheciis constanter obscuratis ab ea differt. Apothecia sat crebra, lat. 0.2—0.23 mm, crass. 0.12 mm, subnitida, margine indistincto. Hypothecium dilute lutescenti-pallidum, hyphis subverticaliter aut sat irregulariter dispositis, cavitatibus cellularum subglobosis, 0.003—0.0015 mm latis, membranis tenuibus aut modice incrassatis. Hymenium 0.050—0.055 mm crassum, jodo persistenter caerulescens. Epithecium KHO saepe demum fere decoloratum. Perithecium pallidum aut aeruginosum, chondroideum, modice pachydermaticum, cavitatibus 0.001 mm crassis. Paraphyses arcte cohaerentes, simplices, tubulo tenui, membrana in KHO turgescente. Asci late clavati, long. 0.030, crass. circ. 0.020 mm, polystichi. Sporae rectae aut p. p. leviter curvatae, altero apice obtuso rotundatove, altero attenuato. Gonidia globosa, tantum simplicia visa, diam. 0.010—0.014 mm, membrana modice incrassata.

15. *B. gomphillacea* (Nyl.) Vain.

Stereocauliscum gomphillaceum Nyl. Fl. 1865 p. 211; Norrl. Bidr. Sydöstr. Tav. Fl. (1870) p. 174; Hue Addend. I (1886) p. 24. *Bilimbia milliaria* status monstrosus Th. Fr. Lich. Scand. II (1874) p. 383.

Thallus verruculosus aut verruculoso-inaequalis, esorediatus. Apothecia parva, subglobosa aut hemisphaerica aut verticaliter elongata, basi constricta aut plus minus distincte prolifero-stipitata, stipite saepe 0.5—1 mm alto, vulgo pallido, raro obscurato, disco atro aut rarius fusconigricante, nudo, margine mox excluso. Hymenium dilute aeruginosum aut decoloratum aut parte inferiore dilute aeruginosum aut epithecio pallido. Hypothecium decoloratum aut superne dilute aeruginosum. Sporae fusiformes,

apicibus vulgo obtusis, 3—7-septatae, „long. 0.023—0.033, crass. 0.006—0.007 mm“ (sec. Nyl.) aut minores.

Distr. Ad rupem quarziticam abundanter et ad muscos destructos parce in caverna Pirunpesä in monte Tiirismaa (Hollola) in Ta. a. 1863 indagata ab J. P. Norrlin. Postea ibi a me lecta adhuc a. 1883. Nunc hoc locum natale unicum „Stereocaulisci“ omnino destructum est, sed specimina numerosa in herb. Nyl. et meo et mus. Fenn. restant.

Thallus sat tenuis aut raro sat crassus, dispersus aut continuus, albidus aut albido-cinereus vel albido-glauescens, hypothallo albedo aut indistincto. Apothecia lat. 0.3—0.4 (—0.5) mm, saepe sat crebra, interdum tuberculoso-divisa, disco saepe leviter nitido. Stipes interdum in parte exteriori glomerulos gonidiorum continens, saepe tantum ex apotheciis 2—3 superpositis, proliferantibus formatus, quod jam e sectione longitudinali a Nyl. praeparata (n. 40214 in herb. Nyl.) optime elucet. Hypothecium in parte superiore hyphis sat erectis, leviter pachydermatis, conglutinatibus, cavitatibus angustis, parte inferiore irregulariter contextum, sat pachydermaticum. Perithecium decoloratum, ex hyphis radiantibus, sat pachydermatis, conglutinatibus formatum, cavitatibus angustis. Hymenium circ. 0.070 mm crassum, jodo sat dilute caerulescens. Paraphyses arcte cohaerentes, basim versus ramoso-connexae, ceterum simplices, tubulis vix 0.001 mm crassis (apice haud incrassatis), gelatinam in KHO bene turgescens percurrentibus. Asci clavati, long. circ. 0.070, crass. 0.014 mm, in apice membrana modice incrassata. Sporae 8-nae, saepe tetrastichae, aut abortu in seriebus paucioribus, haud raras, interdum altero apice caudato-attenuato, vulgo 3-septatae, parcius 4—7-septatae, haud raro long. 0.019—0.021, crass. 0.005 mm. Gonidia micareoidea, dilute flavescens, simplicia globosa et diam. 0.005—0.007 mm, saepe bicellulosa aut glomerulosa, pariete gelatinoso communi bene incrassato. — Apotheciis stipitatis analoga est *Bacidia ophiosporae*, nec status monstrosus *Bilimbiae milliariae* (*B. lignariae*), ut indicat Th. Fr., apotheciis basi magis constrictis nec late adnatis, paraphysibus magis ramoso-connexis, colore hypothecii, stipite vulgo plus minus evoluto et gonidiis magis gelatinosis ab hoc lichene differens.

16. **B. melaena** (Nyl.) Arn.

Fl. 1865 p. 596, Lich. Tirol IV (1869) p. 624, XI (1873) p. 515, 519, Lich. Münch. (1891) p. 87; Th. Fr. Lich. Scand. II (1874) p. 383. *Lecidea melaena* Nyl. Bot. Not. 1853 p. 182; Stizenb. Lec. Sab. (1867) p. 54. *Micarea* Hedl. Bem. Lec. Micar. (1892) p. 82, 96. *L. sphaeroides* **L. melaena* Nyl. Lich. Scand. (1861) p. 205. *L. milliaria* var. *turfosa* Fr. Nov. Sched. Crit. I (1826) p. 7 (Lich. Suec. Exs. n. 212 A) sec. Th. Fr. l. c. p. 383 (nomen ineptum). *L. milliaria* var. *lignaria* Fr. l. c. p. 8 (Lich. Suec. Exs. n. 212 B) sec. Th. Fr. l. c. (haud *L. lignaria* Ach.). *L. milliaria* var. *rudeta* Fr. Summ. Veg. Scand. (1846) p. 114 sec. Th. Fr. (nomen nudum). *Biatora Stizenbergeri* Hepp Flecht. Eur. III (1860) n. 504.

Exs. Fr. Lich. Suec. Exs. VIII (1826) n. 212 A, B. — Hepp Flecht. Eur. III (1860) n. 504. — Fellm. Lich. Arct. (1864) n. 159. — Arn. Lich. Exs. (1866) n. 332 a, b. — Norrl. et Nyl. Herb. Lich. Fen. IV (1875) n. 180. — Zwackh Lich. Exs. (1881) n. 657, 675. — Arn. Lich. Monac. (1889) n. 49, (1892) n. 248, 249, (1895) n. 407. — Zahlbr. Krypt. Exs. Vindob. IV (1899) n. 362. (Sec. cit.)

Thallus verruculosus, dispersus aut subcontinuus, vulgo esorediatus, saepe etiam evanescens. Apothecia parva, basi leviter constricta, convexa, immarginata, atra. Hypothecium rubricosum vel violaceo-fuscescens. Epithecium obscuratum. Paraphyses gelatinosae. Sporae oblongae (aut raro ovoideo-oblongae), apicibus rotundatis, 3-septatae aut raro subsistententer 1-septatae, long. 0.014—0.018 (raro — 0.028), crass. 0.005 (0.004—0.006) mm.

Distr. Ad lignum carbonisatum aut putrescens in pinetis et silvis plus minus humidis, rarius ad plantas destructas in rupibus et turfosis, interdum etiam ad terram arenosam lapillosque inter radices abietum crescit. LIn.: Ad Muddusjärvi et in Luosmavaara (F. Silén), Ruoptuivaara, Veskonieni, Paatsjoki, Inari, nec rara in reg. pinifera (Vain. Adj. Lich. Lapp. II p. 12). LEnont.: „Etiam in reg. betulina et (ad Naimakka) in reg. alpina“ (Norrl. Ber. Torn. Lappm. p. 337), ad Kilpisjärvi (Norrl.). LKem.: „In reg. coniferarum haud rara“ (Norrl. l. c.), Kaaresuanto (Norrl.), Pyhätunturi, Sodankylä („sat frequenter in reg. conif. mixt.“ (Vain. l. c.). LIm.: „Usque ad lacum Imandram“ (Fellm., Nyl. Lich. Lapp. Or. p. 151). In reg. magis meridionali-

bus praesertimque in reg. silvosis sat frequenter provenit.

Thallus tenuis aut modice incrassatus aut evanescens, olivaceus aut cinereo-glauescens cinerascensve, verruculis saepe irregularibus, raro granulis soredioideis immixtis. Apothecia crebra, lat. 0.3—0.2 (—0.4) mm, saepe demum etiam tuberculoso-confluentia, leviter nitida, nuda. Hypothecium KHO sordide violaceum, maxima parte superiore hyphis sat erectis, leviter pachydermaticis. Perithecium dilute subviolascens aut extus subdecoloratum, hyphis radiantibus, conglutinatis, leviter pachydermaticis, tubulis tenuibus. Epithecium fuligineum. Hymenium superius aeruginosum (KHO dilutescens aut sordide subolivaceum vel sordide subviolascens) aut cyanescens aut sordide violaceum fuscescensve (KHO parum reagens aut sordide violascens), circ. 0.036—0.040 mm crassum („0.050—0.070 mm“ sec. Stizenb.), jodo sat dilute caerulescens, dein decoloratum, ascis vinose rubentibus („caerulescens deindeque obscuratum“ sec. Stizenb.). Paraphyses arcte cohaerentes, increbre ramoso-connexae, membranis gelatinosis, in KHO turgescitibus, tubulis 0.001 mm crassis. Asci „long. 0.040—0.050, crass. 0.014 mm“ (sec. Stizenb.). Sporae 8-nae, distichae aut 3-stichae aut 4-stichae, rectae aut rarius leviter curvatae. Gonidia micareoidea, flavescientia, ellipsoidea et long. 0.006, crass. 0.003 mm, aut subglobosa globosave et diam. circ. 0.005 mm, p. p. bicellulosa et vulgo demum glomerulosa, membrana gelatinoso-incrassata et KHO turgescente.

F. catillarioides Vain. (*L. melaena* f. *catillarioides* Vain. Adj. Lich. Lapp. Or. II, 1883, p. 12, *Micarea melaena* f. *catillarioides* Hedl. Bem. Lec. Micar., 1892, p. 83, 96). Sporae 1-septatae aut raro 2-septatae. — Supra muscos in rupe ad Riihivaara in Nurmes in Karelia bor. (Vain.). — Hymenium partim aeruginosum aut violaceum, epithecio fuligineo. Sporae ovoideo-oblongae, long. 0.012—0.018, crass. 0.004—0.005 mm. — *Biatora Stizenbergeri* Hepp Flecht. Eur. III (1860) tab. LVIII n. 504, sporis 1-septatis, 0.009—0.015 mm longis descripta, in herb. meo abundanter etiam sporis 3-septatis, 0.017—0.020 mm longis, hymenio sordide violascente et (in altero specimine) cyanescente instructa est.

F. endocyanea Vain. (*L. melaena* f. *endocyanea* Vain. l. c., *Micarea* Hedl. l. c.). Hymenium totum aut parte superiore cyanescens, epithecio fuligineo. Locis numerosis.

F. aeruginosa Vain. Epithecium fuligineum, ceterum hymenio toto aut parte superiore aeruginoso. Locis numerosis.

F. **epiphaeotera** Vain. Epithecium fuligineum aut hymenio toto vel partim sordide subviolascente aut subfuscescente. Locis numerosis. Hae formae valde inconstantes sunt.

F. **decrustata** Vain. Thallo evanescente differt a formis praecedentibus, quae thallo distincto instructae sunt. Locis numerosis. — Hymenium sordide violascens aut forsitan etiam colore varians.

Obs. In specimine ad lignum putridum in Särkilahti prope Kuopio a K. Linkola collecto supra thallum *B. melaenae* abundanter crescit alga *Nylanderia tentaculata* Hariot (Not. Trentepohl. p. 41 in Journ. Bot. 1890).

17. *B. trisepta* (Naeg.) Arn.

Lich. Monac. Exs. (1890) n. 118, Zur Lich. Münch. (1891) p. 86, (1896) p. 26, Labrador (1896) p. 15. *Biatora trisepta* Naeg. in Müll. Arg. Princ. Class. Lich. (1862) p. 60. *L. sabuletorum* f. *trisepta* Stizenb. Lec. Sabul. (1867) p. 47. *Bilimbia milliaria* β. *trisepta* Th. Fr. Lich. Scand. II (1874) p. 382. *Lecidea trisepta* Nyl. Fl. 1875 p. 361. *B. subviridescens* var. *trisepta* A. Sm. Mon. Brit. Lich. II (1911) p. 144. Non est *L. triseptata* Hepp in Zolling. Syst. Verzeichn. (1854) p. 9.

Exs. Hepp Flecht. Eur. I (1853) n. 20, V (1857) n. 284, 285. — Leight. Lich. Brit. Exs. VIII (1856) n. 238. — Zwackh Lich. Exs. (1858) n. 276. — Arn. Lich. Exs. (1861) n. 167 b, (1884) n. 1051. — Rabenh. Lich. Eur. Exs. XXI (1861) n. 582. — Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 319. — Arn. Lich. Monac. Exs. (1890) n. 118, (1892) n. 269, 270, (1894) n. 357, (1897) n. 482. (Partim sec. cit.)

Thallus verruculosus aut parce verrucosus, esorediatus. Apothecia parva, late adnata, hemisphaerica aut rarius subglobosa, primum depresso-convexa, immarginata, vulgo atra, nuda. Hymenium totum aut epithecium aeruginosum vel caeruleo-aeruginosum. Hypothecium sordide pallidum decoloratumve aut dilute fuscescenti-pallidum. Sporae oblongae aut fusiformes, apicibus obtusis, 3-septatae, long. 0.012—0.030, crass. 0.005—0.007 mm.

Distr. Supra muscos destructos in lateribus rupium et ad ipsam rupem et ad lignum et corticem vetustum crescens, sat raro vel passim in territorio nostro provenit. Loca specialia sub formis indicata sunt.

Thallus sat tenuis aut raro crassus, albidus aut cinerascens, verruculis dispersis aut conglomeratis aut contiguis, aut supra hypothallum albidum aut partim caerulescentem inspersus, aut

raro evanescens. Apothecia lat. 0.3—0.7 (0.2—0.9) mm, vulgo atra subnitidaque, raro aeruginoso-atra aut latere cinereo-fuscescentia aut livido-pallescentia opacaque. Hypothecium parte superiore hyphis erectis, conglutinatis, sat pachydermatis, in parte inferiore irregulariter contextis, saepe superne jodo caerulescens, KHO non reagens aut intensius pallidum, sec. Nyl. (Fl. 1868 p. 474) interdum flavescens. Perithecium saepe intus sordide violascens fuscescensve et extus pallidum aut totum pallidum, hyphis radiantibus, conglutinatis, sat modice pachydermatis, tubulis tenuibus. Epithecium KHO parum reagens aut subolivaceum aut dilutius coloratum, in apotheciis pallidioribus partim aeruginosum, partim decoloratum. Hymenium indistincte limitatum, sec. Stizenb. „crass. 0.040—0.070 mm“, jodo persistenter caerulescens (demum etiam vinose rubens sec. annot. Nyl. in herb. suo). Paraphyses arcte cohaerentes, simplices, apicibus haud aut leviter incrassatis, membranis KHO turgescenscentibus, tubulis tenuibus. Sporae distichae, 3-septatae (aut raro parce in eodem apothecio 5-sept.). Gonidia globosa, diam. 0.008—0.004 mm, tantum simplicia visa, membrana sat tenui, haud gelatinosa. Conidia „recta, long. 0.007, crass. vix 0.001 mm“ sec. Nyl. in f. *triseptatula*, „ovalia vel subellipsoidea, long. 0.0025, crass. 0.0013 mm“ sec. Linds. Sperm. p. 264 ad Schaer. Lich. Exs. n. 196 (conf. Arn. Lich. Münch., 1891, p. 86).

F. *ternaria* (Nyl.) Vain. *Lecidea sabuletorum* f. *ternaria* Nyl. Lich. Lapp. Or. (1866) p. 151. *L. ternaria* Nyl. Fl. 1877 p. 232, Fl. 1878 p. 248. *L. trisepta* var. *ternaria* Vain. Lich. Exp. Veg. Pittek. (1909) p. 106.

Apothecia atra, simplicia aut parce confluentia. Thallus verruculosus aut verrucis parcis immixtus.

Distr. Ad muscos destructos et lignum et corticem putridum crescit. Ab.: Jurmo (E. Nylander, „*L. vernalis* v. *montana*“ Nyl.), Vihti (W. Nyl., „*L. vern.* v. *montana*“). N.: Prope Lounatkorkia Hoglandiae (Brenner Bidr. Hogl. Lafv. p. 91). Ta.: Herala in Hollola (Vain.), Nyystölä in Padasjoki (Vain.), Evo (J. P. Norrlin, n. 18699 in herb. Nyl.), Tianen in Korpilahti (Vain. Fl. Tav. Or. p. 113). KLad.: Kirjavalahki (Norrl. Symb. Fl. Ladog.-Kar. p. 29). LIm.: Sascheika (P. A. Karsten). LMur.: Olenji (N. I. Fellman).

Sec. annot. Nyl. „jodo gelatina hymenialis caerulescens, dein lutescens, thecae vinose fulvae“ (conf. Nyl. Fl. 1877 p. 232). *L. milliaria* **L. trisepta* Nyl. in Hue Addend. II (1888) p. 160 (*L. milliaria* var. *trisepta* Nyl. Fl. 1877 p. 232) sporis longioribus tenuioribusque (l. 0.015—0.027, cr. 0.003—0.004 mm) distinguitur a **L. ternaria*. „G. h. jodo persistenter caerulescens et obscurata (praesertim thecae tinctae)“ sec. annot.

Nyl. *L. milliaria* var. *triseptata* Nyl. in Hue l. c. (*L. ternaria* var. 3-septata Nyl. Fl. 1878 p. 248), „ascis jodo persistenter caerulescentibus“ distincta, quoad specimina Europaea perperam jungitur cum *Bilimbia triseptata* (Hepp), quae sec. specim. orig. in herb. Nyl. apotheciis majoribus, planis, persistenter marginatis instructa est.

F. saxicola (Koerb.) Arn. Lich. Fränk. Jur. (Fl. 1884) p. 179 p. p., Lich. Exs. (Index, 1894) p. 5, n. 167 a. *B. milliaria* β . *saxicola* Koerb. Par. Lich. 2 Lief. (1860) p. 171.

Apothecia atra, vulgo simplicia. Thallus verruculosus, dispersus, vulgo tenuis. *Saxicola*.

Distr. Prope Humaljärvi in Kyrkslätt (G. Lång) et prope Selkäpajanlahti Hoglandiae („*L. ternaria*“ in Brenn. l. c., „*L. saxigena* Uloth“ in herb. Nyl., n. 18698).

Biatora lignaria δ . *saxigena* Hepp, Flecht. Eur. III (1860) n. 510, a W. Uloth lecta („*Lecidea saxigena* Uloth“ sec. Nyl. Fl. 1881 p. 539), apotheciis subsmaragdescentibus et lividis, apotheciis nigris immixtis, a f. *saxicola* differens, in Fennia nondum collecta est. *L. milliaria* var. *saxigena* Leight., Lich. Brit. Exs. VII (1856) n. 210, sec. Stizenb. l. c. p. 44 ad *B. lignariam* nostram pertinet.

F. fraterculans Nyl. in Brenner Bidr. Högsl. Lafv. (1885) p. 92. *Lecidea fraterculans* Nyl. Fl. 1875 p. 11, 448.

Thallus crassus aut sat crassus, e verruculis et verrucis saepe in glomerulos dispersos confertis, albidis constans. Apothecia atra, saepe p. p. aggregata confluentiave. *Saxicola*.

Distr. N.: Somerikonvuoret Hoglandiae (Vain.). Ta.: Nyystölä in Padasjoki (Vain.). Sb.: Pisanvuori in Nilsjö (K. Linkola).

F. leucococca (Nyl.) Vain. *Lecidea sphaeroides* var. *leucococca* Nyl. in Stizenb. Lec. Sab. (1867) p. 18.

Apothecia uno latere vel subdimidiatim cinereo-rufescentia et plurima omnino nigra, opaca, immarginata. Thallus tenuis, verruculosus et partim granulatus.

Distr. Ad lignum vetustum in Evo (J. P. Norrlin).

Perperam a Th. Fr. (Lich. Scand. p. 379) ad *B. Naegelia* relata est. Notae internae sunt f. *ternariae*. Apothecia bene convexa, immarginata. Hypothecium albidum, hyphis erectis. Epithecium in partibus nigris aeruginosum. „Gelatina hymenialis, jodo caerulescens, dein vinose rubens et sporae long. 0.016—0.023, crass. 0.004—0.005 mm, 3-septatae“ sec. annot. Nyl. Asci polystichi. Videas p. 244.

F. triseptatula (Nyl.) Vain. *Lecidea triseptatula* Nyl. Fl. 1875 p. 361.

Apothecia nigricanti-livida aut dimidiatim livida vel livido-pallescentia, opaca, abundanter etiam omnino nigra et atra nitidaque. Thallus tenuis, verruculosus.

Distr. Ad lignum vetustum trunci erecti pini prope Herala in Hollola (Vain.).

Proxima est f. *leucococcae* et in f. *ternariam* evidenter transit. Apothecia pallidiora depresso-convexa, nigra bene convexa. „Jodo gelatina hymenialis caerulescens (dein thecae vinose fulvescentes), thalamium vix tinctum“ (sec. Nyl.). Conidia „recta, long. 0.007, crass. vix 0.001 mm“ sec. annot. Nyl. — *B. peliocarpa* Anzi [Neosymb. Lich. (1866) p. 10], apotheciis partim carneopallidis aut aeruginoso-maculatis ab hac forma differens, sit autonoma species. — *B. milliaria* f. *livescens* Th. Fr., Lich. Scand. II (1874) p. 383 (Hedl. Krit. Bem. Lec. Micar. p. 92), ad f. *leucococcam* aut *triseptatulam* pertineat.

F. simplicior (Nyl.) Vain. *Lecidea sphaeroides* **L. sabuletorum* f. *simplicior* Nyl. Lich. Scand. (1861) p. 205 p. p. *L. sabuletorum* var. *simplicior* Nyl. Lich. Lapp. Or. (1866) p. 151; Stizenb. Lec. Sab. (1867) p. 48, tab. III A f. 63—68.

Apothecia atra, subnitida. „Sporae parcius 3—2-septatae, vulgo 1-septatae, long. 0.011—0.020, crass. 0.004—0.006 mm“ (sec. Stizenb. et Nyl.). „Hymenium crass. 0.065—0.070 mm, jodo caerulescens, dein vinose fulvescens, ascis apice caerulescentibus ceterumque violascentibus, epithecium aeruginosum, hypothecium pallidum“ (sec. Stizenb.). Thallus verruculis cinerascentibus pallidisve, nec fistulosis nec clavatis nec in hypothallum radiceformem continuatis (qua nota a *Thalloed. squalescente* differt).

Distr. Supra Grimmias in Kipinä in Llm. (G. Selin, nec Simming, ut indicat Stizenb.).

Ad *Th. squalescens* a Th. Fr. l. c. p. 340 perperam relata, magis similis est *Catillariae Dufourei* (Nyl.), quae sporis constanter 1-septatis a f. *simpliciore* (Nyl.) differt. De speciminibus ad Helsingforsiam et in Suecia collectis, a Nyl. citatis, videas p. 140.

Obs. *L. trisepta* var. *polytropoides* Vain. (Lich. Exp. Vegae Pitlekai, 1809, p. 106), thallo soredioso instructa, autonoma est species.

18. B. Nitschkeana Lahm

in Rabenh. Lich. Eur. Exs. XXI (1861) n. 583; Stizenb. Lec. Sabul. (1867) p. 70; Th. Fr. Lich. Scand. II (1874) p. 381. *Micarea denigrata* var. *Nitschkeana* Hedl. Krit. Bem. Lec. Micar. (1892) p. 90. *Lecidea spododes* Nyl. Fl. 1869 p. 410 (sec. Nyl. in herb. suo).

Exs. Rabenh. l. c. — Arn. Lich. Exs. (1862) n. 217, (1872) n. 503.
 — Zwackh Lich. Exs. (1876) n. 470 a, (1879) n. 470 bis, 534, (1886) n. 587.
 — Lojka Lich. Univ. III (1886) n. 137.

Thallus verruculosus, saepe parce sorediosus. Apothecia minuta vel minutissima, late adnata, depresso-convexa vel hemisphaerica, immarginata, livido-nigricantia aut nigra aut rarius livido-pallescentia, nuda. Epithecium sordide violascens, KHO pulchre violascens. Hypothecium pallidum. Sporae vulgo oblongae, apicibus obtusis, 3-septatae, p. p. curvatae, long. 0.011—0.015 mm (—0.020 mm sec. Stizenb.), crass. 0.003 mm (raro 0.004, — „0.0025 mm“ sec. annot. Nyl.).

Distr. Praesertim ad corticem Pini sylvestris crescit et in Germania collecta etiam ad corticem aliarum arborum. Ad Mustiala in Ta. (A. Kullhem) una cum Catillaria synothea sec. Th. Fr. l. c. p. 381 et 578.

Facie externa vix differt a forma apotheciis minus intense coloratis instructa *Catillariae synotheae*, sed sporis 3-septatis, paraphysibus crassioribus et ramoso-connexis atque hypothecio alio modo contexto ei dissimilis. Thallus tenuis aut raro magis evolutus, vulgo dispersus, saepe sorediis parum distinctis, interdum bene sorediosus, albido-glauescens aut cinerascens. Apothecia saepe crebra, lat. 0.2—0.3 mm. Hypothecium hyphis irregulariter contextis, membranis modice incrassatis, tubulis tenuibus. Hymenium circ. 0.040 mm crassum, jodo persistenter caerulescens („dum fusco-violascens“ sec. Stizenb. et „violaceo-fuscescens“ sec. annot. Nyl.). Epithecium sordide violascens, sec. Stizenb. „olivaceum“. Paraphyses tubulis crass. 0.0015 mm, parce ramoso-connexis ramosisque, gelatinam in KHO turgescens percurrentibus. „Asci pyriformes, long. 0.025—0.036, crass. 0.012 mm“ (sec. Stizenb.), „polystichi“ (sec. annot. Nyl.). Sporae p. p. rectae. Gonidia globosa aut subglobosa, diam. 0.008—0.011 mm, simplicia et parce 1-septata, vacuolis lateralibus, membrana tenui, haud gelatinosa (descr. anatom. sec. Zwackh L. Exs. n. 534). In Zwackh L. Exs. n. 470 Nyl. sec. annot. in herb. suo conidia observavit bacilliformia, recta, long. 0.006, crass. 0.0006 mm (similia etiam in specim. ad Eichstätt ab Arn. lecto vidit) et simul alia filiformia, arcuata, long. 0.016—0.020, crass. 0.001 mm.

19. *B. albidolivens* (Nyl.) Blomb. et Forssell

Enum. Plant. Scand. (1880) p. 82. *Lecidea albidolivens* Nyl. Fl. 1874 p. 10; Hue Addend. II (1888) p. 159.

Thallus tenuissimus, macula albida vel cinerascens indicatus, laevigatus aut verruculis cinereo-glauciscentibus, valde depressis, gonidia continentibus inspersus, esorediatus. Apothecia minutissima, albido-pallida aut livido-cinerea aut livido-nigricantia nigrave in eodem specimine, late adnata, primum depresso deinde bene convexa, nuda, immarginata. Hypothecium decoloratum aut pallidum. Hymenium totum decoloratum aut (in apotheciis obscurioribus) partim sordide caeruleo-fuscescens vel sordide violascens aut epithecio violascente. Perithecium albidum aut in apotheciis obscuratis intus caeruleo-fuscescens et extus pallidum. Sporae polystichae, oblongae aut fusiformi-oblongae, apicibus obtusis, 3-septatae, long. „0.016—0.024 mm“ (sec. Nyl.), crass. 0.004—0.0045 mm.

Distr. Ad truncum putridum in littore stagni prope Nyystölä in Padasjoki in Ta. (Vain.).

Apothecia lat. 0.2 (—0.3) mm, crebra, parum nitidula. Hypothecium hyphis verticalibus, membranis leviter incrassatis, cavitatibus 0.0015—0.003 mm latis, ellipsoideis oblongisve et partim rotundatis, in parte inferiore hyphis irregulariter contextis. Perithecium hyphis radiantibus, pachydermaticis, cavitatibus tenuibus, elongatis. Hymenium circ. 0.050 mm crassum, KHO dilutius coloratum, jodo persistenter caerulescens (sicut etiam hypothecium), sec. Nyl. demum fulvo-lutescens. Paraphyses arcte coherentes, tubulis 0.001—0.0015 mm crassis, ramosis et parce ramoso-connexis, gelatinam in KHO turgescens percurrentibus. Asci late clavati, long. 0.035—0.040, crass. 0.014—0.022 mm. Sporae in seriebus 4—5 dispositae, rectae aut sec. Nyl. leviter curvatae. Gonidia globosa, simplicia diam. 0.007—0.004 mm, parce 2-cellulosa visa, demum glomerulosa, membrana sat tenui, forsan pleurococcoidea.

Obs. Habitu subsimilis est *B. peliocarpae* Anzi (Neosymb. Lich., 1866, p. 10), quae autem sec. specim. orig. in herb. Nyl. thallo minutissime verruculoso, verruculis dispersis, elevatis, fere granuliformibus, et sec. descr. hymenio „superne subsmaragdulo“ ab *B. albidolivente* differt. Ambae affines sunt speciei *B. trisepta* dictae. *L. violacea*

Crouan (Nyl. Fl. 1862 p. 464) verruculis depressis thalli et apotheciis livido-fuscescentibus ab his differt. *B. albicans* Arn. (Fl. 1872 p. 140), a qua Zwackh Lich. Exs. n. 897 recedit, sit proxima *B. violaceae* (Crouan), sed species autonoma. *L. hemipolioides* Nyl. (Fl. 1873 p. 294) habitu *B. Naegelii* ab his omnibus distinguitur.

20. *B. atrolivida* Vain.

Lecidea atrolivida Vain. Adj. Lich. Lapp. II (1883) p. 10, 209.

Thallus sat crassus aut modice incrassatus, verruculoso-inaequalis, saepe areolato-diffractus aut subdispersus, parce solediosus. Apothecia mediocria, late adnata, disco sublivido-fuscescente vel livido-nigricante, primum plana marginataque, margine saepe pallidiore (testaceo-fuscescente), sat tenui, demum convexa immarginataque. Hymenium superius striatim fuscescens. Hypothecium pallidum aut parte superiore sat dilute fuscescens. Perithecium extus pallidum et in margine intus fuscescens. Sporae fusiformes, apicibus obtusis, 3-septatae, long. 0.017—0.020, crass. 0.006—0.007 mm.

Distr. Ad basim rupis chloritico-schistosae prope Saarenmylly in par. Kianta in OKaj. (Vain.).

Proxima est *B. obscuratae*, sed thallo parce soledioso ab ea differens. Thallus etiam magis evolutus, apothecia latius adnata et margo apotheciorum intus fuscescens, quae notae autem in *B. obscurata* variant. — Apothecia lat. circ. 0.7—1.3 mm, sat dispersa aut partim aggregata, opaca, nuda. Perithecium 0.090—0.120 mm crassum, ex hyphis radiantibus, sat modice pachydermaticis, conglutinatis formatum, cavitatibus angustis, oblongis. Hypothecium irregulariter contextum, in parte superiore sat modice pachydermaticum, cavitatibus subrotundatis, in parte inferiore pallidum, pachydermaticum, cavitatibus elongatis, tenuibus. Hymenium 0.120—0.110 mm crassum, jodo persistenter caerulescens, ascis partim fuscescentibus aut fulvescentibus. Epithecium et partes obscuratae apothecii KHO distinctius violascunt. Paraphyses arcte cohaerentes, simplices, tubulis crass. 0.001 mm et apice 0.0015—0.002 mm clavatisque, membrana gelatinosa tenui, in KHO parum turgescens. Gonidia cystococcoidea, simplicia, subglobosa et diam. circ. 0.012—0.014 mm, sat pachydermatica, saepe etiam majora, diam. circ. 0.020—0.018 mm, et autosporas, diam. 0.006—0.008 mm, irregulariter subglobosas continentia.

21. *B. obscurata* (Sommerf.) Th. Fr.

Lich. Arct. (1860) p. 182 (excl. var.), Bot. Not. 1863 p. 108, Lich. Scand. II (1874) p. 372. *Lecidea sphaeroides* b. *obscurata* Sommerf. Suppl. Fl. Lapp. (1826) p. 165 (sec. Th. Fr.). *L. sabuletorum* v. *obscurata* Stizenb. Lec. Sab. (1867) p. 33. *Mycobilimbia obscurata* Rehm in Rabenh. Krypt. Ascom. (1896) p. 328; Vouaux Bull. Soc. Myc. Fr. (1913) p. 437. *Bilimbia fusca* Mass. Ric. Lich. Crost. (1852) p. 121. *L. sphaeroides* **L. sabuletorum* 1) *triplicans* Nyl. Lich. Scand. (1861) p. 205. *L. sabuletorum* v. *triplicans* Nyl. Lich. Lapp. Or. (1866) p. 151. *L. triplicans* Nyl. in Norrl. et Nyl. Herb. Lich. Fenn. IV (1875) n. 174, Enum. Lich. Fret. Behr. (1888) p. 24, 65. *Bilimbia sphaeroides* a. *terrigena* (Koerb.) Anzi Lich. Rar. Langob. (1861) n. 166.

Exs. Koerb. Lich. Sel. Germ. I (1856) n. 14 (in herb. Nyl.). — Anzi Lich. Rar. Langob. V (1861) n. 166 (sec. Stizenb. l. c.). — Arn. Lich. Exs. (1872) n. 504. — Norrl. et Nyl. l. c. n. 174. — Zwackh Lich. Exs. (1881) n. 685. — Zahlbr. Krypt. Exs. Vindob. VII (1901) n. 656.

Thallus verruculoso-inaequalis, esorediatus. Apothecia majuscula aut mediocria aut rarius parva, basi bene contracta, disco primum plano, demum convexo, fusco nigricanteve aut rufescente testaceove, haud pruinoso, margine sat crasso, vulgo demum excluso. Hypothecium subpallidum decoloratumve. Hymenium pallidum aut subfuscescens. Sporae fusiformes oblongaeve, apicibus vulgo obtusis, long. vulgo 0.016—0.020 (—0.034), crass. 0.006—0.008 mm, 3-septatae.

Distr. Supra muscos destructos ad basim rupium saxorumque et truncorum Populi, Salicis capreae et Sorbi, raro etiam ad lignum putridum in silvis et pratis crescit, passim in territorio nostro proveniens.

F. *fusca* (Mass.) Vain. *L. triplicans* f. *obscurata* Vain. Adj. Lich. Lapp. II (1883) p. 7.

Thallus vulgo tenuis. Apothecia fusciscentia aut nigricantia. — Est forma maxime distributa hujus speciei.

Thallus tenuis aut raro sat crassus, cinereo-glauescens aut raro albidus vel pallido-glaucus, subcontinuus aut dispersus. Apothecia lat. 1.2—0.7 (—2) mm, margine interdum primum prominente, disco vulgo concolore. Perithecium pallidum aut praesertim in margine rubricosofuscens, ex hyphis radiantibus, sat modice pachydermaticis, conglutinatis formatum, cavitatibus 0.0015—0.001 mm latis, oblongis. Hypothecium superne interdum dilutissime fuscens, inferne late pachydermaticum,

irregulariter contextum, tubulis 0.001 mm latis, oblongis elongatisve, superne in zona tenui minus pachydermaticum et cavitatibus brevioribus, latioribus, 0.0015—0.002 mm latis. Hymenium crass. circ. 0.090 mm („—0.060 mm“ sec. Stizenb.), pallidum aut totum dilute fuscescens aut parte superiore rubricosus-fuscescens, jodo caerulescens deindeque vinose rubens. Paraphyses arcte cohaerentes, simplices, membranis gelatinoso-incrassatis, cavitare parum septata, 0.001 mm lata aut in apice paullo latiore. Asci clavati, long. circ. 0.060, crass. 0.012—0.016 mm. Sporae 8-nae aut abortu pauciores, distichae, interdum partim apicibus sat acutis. Epithecium „KHO non mutatur“ (sec. Th. Fr.) aut paullo distinctius rubricosum. Conidangia „fere immersa; sterigmata simplicia aut parum ramosa; conidia long. 0.005—0.008 mm“ (Flagey Lich. Franch.-Comt. II, 1886, p. 361). Gonidia cystococcoidea, simplicia diam. circ. 0.008—0.010 mm, membrana sat tenui aut sat crassa, vacuolis lateralibus, plurima glomerulos formantia 0.026—0.030 mm latos, autosporas numerosas, globosas, 0.005—0.008 mm latas continentia.

F. vernaliformis Vain. *L. triplicans* *f. *vernaliformis* Vain. Adj. Lich. Lapp. II (1883) p. 8.

Thallus tenuis. Apothecia testacea aut testaceo-rufescentia aut partim fusco-rufescentia. — Locis numerosis collecta.

F. rhypara Vain. *L. triplicans* f. *rhypara* Vain. Adj. Lich. Lapp. II p. 8, Lich. Veg. Pitlekai (1909) p. 105.

Thallus sat crassus, cinereo-glauescens. Apothecia fusciscentia aut nigricantia. Thallo esoredioso a *B. atrolivida* et *B. epixanthoide* differt.

Distr. Nonnullis locis collecta, velut ad Niemi in Lohja (C. E. Boldt) in N., Koski in Ta. (Vain.), Uhtua in KVien. occ. (Vain.), Kängäs prope Mare Glaciale et Koppelo in LIn. (Vain. l. c.).

F. leucorhypara (Nyl.) Th. Fr. Lich. Scand. II (1874) p. 373 (Vain. Adj. Lich. Lapp. II p. 8). *L. sphaeroides* **leucorhypara* Nyl. Lich. Lapp. Or. (1866) p. 183. *L. sabuletorum* var. *obscurata* f. *leucorhypara* Stizenb. Lec. Sab. (1867) p. 35. *L. leucorhypara* Nyl. in Norrl. Ber. Torn. Lappm. (1873) p. 337.

Thallus sat crassus aut sat tenuis, albedo-glauescens aut albedo-cinereascens, haud sorediosus. Apothecia fusco-rufescentia aut parce etiam sordide testacea, plana aut demum convexa.

Distr. Ad Kargostrov (A. Kullhem), Dianovagora („f. *obscurior* Nyl.“, Kullh.), Perttiniemi (J. P. Norrlin) in KOn., ad Kiannanniemi (Vain.) in OKaj., ad Kilpisjärvi (Norrl.) in LEnont.

Obs. *Lecidea substipitata* Nyl., Fl. 1865 p. 5 (Kihlm. Neu. Beitr. Flecht. Kola, 1891, p. 57, *L. sphaeroides* **substipitata* Nyl. Lich. Lapp. Or., 1866, p. 83, *L. sphaeroides* f. *substipitata* Stizenb. Lec. Sabul., 1867,

p. 17, *L. sabuletorum* **L. triplicans* f. *substipitata* Nyl. in litt. sec. Norrl. Fl. Kar. Oneg. II, 1876, p. 30), thallo tenui, albido, apotheciis carneo-rufescentibus, convexis, basi bene constrictis, nec substipitatis, sed interdum particulae angustae substrati thallicque affixis, instructa, thallo tenuiore a f. *leucorhynpara*, cui proxima est, differt. Ad vegetabilia destructa in Jalguba in KOn. (A. Kullh.). — F. *prolifera* Nyl. in Norrl. l. c., apotheciis fuscis, demum proliferis morbosisque instructa est. — *L. tylocarpa* Nyl., Fl. 1865 p. 5, Lich. Lapp. Or. (1866) p. 150 (*L. sphaeroides* var. *tylocarpa* Stizenb. l. c. p. 17, *L. sabul.* **L. triplicans* f. *tylocarpa* Nyl. in litt. sec. Norrl. l. c.), sec. specim. orig. est *B. obscurata* f. *fusca* (Mass.) Vain., thallo tenui.

Var. *microcarpa* Th. Fr. Lich. Aret. (1860) p. 183. *B. microcarpa* Th. Fr. Bot. Not. 1863 p. 9. *Lecidea sabuletorum* var. *obscurata* f. *microcarpa* Stizenb. l. c. p. 36. *B. hypnophila* **B. microcarpa* Th. Fr. Lich. Scand. II (1874) p. 376. *L. obscurata* var. *microcarpa* Vain. Fl. Tav. Or. (1878) p. 113. *L. sabuletorum* **L. meiobola* Nyl. in litt. sec. Norrl. Fl. Kar. Oneg. II (1876) p. 30. *L. triplicans* **L. meiobola* Nyl. in Stizenb. Lich. Helv. II (1882) p. 163. *L. meiobola* Nyl. Enum. Lich. Fret. Behr. (1888) p. 65.

Apothecia parva, demum convexa immarginataque, nigra (vel fusciscentia).

Distr. Supra muscos et alia vegetabilia destructa in rupibus et ad terram locis calcariis aut argillaceis aut silaceis, raro ad ligna putrescentia et ad corticem Salicis capreae. Al.: (E. Nylander). N.: Hoglandia (M. Brenner Bidr. Høgl. Lafv. p. 85, herb. Nyl.), in monte Observatorii Helsingforsiae (Nyl.). Ka.: Castellum Viburgi (Vain. Lich. Vib. p. 63). Ta.: Hollola (J. P. Norrlin). Tb.: Piililä in Korpilahti (Vain.). KOL.: Petrosavodsk (M. Brenner), Perttiniemi (A. Kullhem sec. Nyl. in Norrl. Fl. Kar. Oneg. II p. 30), Dvoretz (Norrl.). KKER.: Knjäsä (N. I. Fellman). LKEM.: Ad Pajala (Norrl.), Huukki in Kolari (Norrl.).

Thallus tenuis, verruculoso-inaequalis, albido-cinereascens aut cinereo-glauescens, aut fere evanescens. Apothecia lat. 0.6—0.2 (—0.7) mm, adpressa aut late adnata, nuda, opaca. Hypothecium sordide pallidum aut partim dilute subfuscens. Hymenium crass. 0.060—0.070 mm (sec. Stizenb.), jodo intense caerulescens, dein violaceo-obscuratum (sec. annot. Nyl.). Epithecium vel hymenium totum fuscens. Paraphyses cohaerentes. Sporae fusiformes aut oblongae, apicibus obtusis aut sat acutis, rectae (aut raro curvatae sec. Stizenb.), long. circ. 0.020—0.028 mm aut sec. Stizenb. „long. 0.016—0.030 et crass. 0.005—0.006, raro 0.007 mm“, 3-septatae (raro parcissimeque 5-septatae sec. annot. Nyl. in n. 18435 ex Helsingforsia).

Var. *submuricola* Vain. *Lecidea triplicans* var. *submuricola* Vain. Adj. Lich. Lapp. II (1883) p. 8.

Apothecia parva, saepe diu marginata planiusculaque, demum convexa, rufescentia aut p. p. fusciscentia.

Distr. Supra plantas destructas in rupibus calcariis et graniticis et ad terram argillaceam et ad ipsam rupem calcariam et graniticam et ad cimentum murorum et ad corticem populi. Ta.: Messukylä (P. A. Karsten), Pähkijärvi in Tammela (A. Kullhem). Tb.: Piililä in Korpilahti (Vain., cum v. *microcarpa*). Sa.: Järventaipale (**L. sabuletorum* 4. *muricola* Nyl. Lich. Scand. p. 205 p. p., collecta ab E. Nylander). KOn.: Mundjärvi (Norrl.). Kb.: Kalliovaara in Lieksa (Vain.).

In v. *microcarpam* saepe transit et a Th. Fr. in Lich. Scand. p. 376 ad eam relata est. Thallus vulgo tenuis dispersusque, interdum magis evolutus, albido-cinereus, verruculoso-inaequalis, haud sordiosus. Apothecia lat. 0.2—0.6 mm, opaca. Hypothecium lutescens, pallidum aut incoloratum. Hymenium superius dilute fusciscentia rufescentia. Sporae long. 0.017—0.020, crass. 0.006—0.007 mm, apicibus obtusis.

22. *B. granulans* Vain.

Lecidea granulans Vain. Adj. Lich. Lapp. II (1883) p. 4.

Thallus verrucosus aut verruculosus, verrucis 0.4—0.15 mm latis, subglobosis convexusque, saepe irregularibus, dispersis aut aggregatis confluentibusve aut proliferis, numquam squamaeformibus, impure albidus vel subcinereus vel pallidus, interdum evanescens, hypothallo effuso, parum distincto. Apothecia dispersa aut aggregata, circ. 0.3—0.8 mm lata, saepe demum confluentia tuberculoaque, basi constricta, mox convexa immarginataque, carnea, livida, fusciscentia aut fuscoatra, tenuiter pruinosa aut rarius nuda, opaca. Hymenium decoloratum aut epithecio pallido testaceove aut totum dilute subolivaceum. Hypothecium pallidum aut rarius subolivaceo-lutescens aut partim dilute rubricosum-rufescentia. Sporae variabiles, subbacillares vel elongatae, interdum subfusiformes, septis paucis, longitudine variabiles, sat crassae.

Distr. Supra muscos destructos in latere interdum irrigato rupis ad litus stagni prope Kalliovaara in par. Lieksa in Kb. (Vain.). Supra muscos destructos in latere irrigato rupis in monte Pyhätunturi in par. Sodankylä in LKem. (Vain.).

Affinis est *Bilimbiae lignariae* (Ach.) Arn. et *B. chlorococcae*, ab ambabus bene differens. — Thallus interdum crustam sat crassam formans, passim parce sorediosus. Perithecium ex hyphis ramoso-connexis, pachydermaticis formatum, cavitatibus cellularum oblongis, circ. 0.0005 mm latis, chondroideum, subdecoloratum aut pallidum. Hypothecium in parte superiore ex hyphis erectis formatum, limite subhymeniali haud distincto, KHO non reagens. Hymenium circ. 0.050—0.100 mm crassum, jodo caerulescens, dein vinose rubens, ascis caeruleo-violascentibus. Paraphyses arcte cohaerentes, parce ramoso-connexae, tubulis 0.0015 mm crassis, membranis modice gelatinoso-incrassatis, in KHO turgescuntibus, septatae. Asci clavati. Sporae 8:nae, decolores, rectae aut leviter curvatae flexuosaeve, apices versus tenuiores aut apicibus obtusis vel rotundatis, septis vulgo 1—3, raro 4—5 aut simplices, long. 0.015—0.040, crass. 0.005—0.007 mm. Gonidia micareoidea, glomerulosa, cellulis subglobosis aut subellipsoideis, diam. 0.004—0.005 mm, membrana modice incrassata, chromatophoro dilute flavescente.

Sect. 2. *Arthrospora* (Mass.) Vain.

Arthrosporum Mass. Mem. Lich. (1853) p. 127; Koerb. Syst. Lich. Germ. (1855) p. 270. *Arthrospora* Th. Fr. Gen. Heterol. (1861) p. 88, Lich. Scand. II (1874) p. 584. *Bacidia* sect. 1. *Arthrosporum* Zahlbr. Ascol. (1905) p. 136.

Sporae 8:nae—16:nae.

23. *B. populorum* (Mass.) Vain.

Arthrosporum populorum Mass. Mem. Lich. (1853) p. 128, fig. 199. *Lecidea acclinis* Flot. in Koerb. Syst. Lich. Germ. (1855) p. 270, Parerg. Lich. 3 Lief. (1861) p. 242; Nyl. Lich. Paris (1896) p. 88. *Arthrosporum accline* (Flot.) Mass. Geneac. Lich. (1854) p. 20; Koerb. Syst. Lich. Germ. (1855) p. 270. *Arthrospora acclinis* Th. Fr. Gen. Heterol. (1861) p. 88, Lich. Scand. II (1874) p. 585. *Lecidea accline* Nyl. Lich. Scand. (1861) p. 219.

Exs. Mass. Lich. Ital. Exs. VI (1856) n. 204. — Hepp Flecht. Eur. II (1857) n. 281. — Rabenh. Lich. Eur. Exs. VIII (1857) n. 204. — Fellm. Lich. Arct. (1864) n. 179. — Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 322 a—c.

Thallus verruculoso-inaequalis, esorediatus. Apothecia sat parva, basi late adnata, atra, disco plano aut demum depresso-convexo, margine tenui, subpersistente aut demum

excluso. Hypothecium partim rubricoso-pallidum aut pallido-rufescens vel subdecoloratum. Epithecium aeruginoso-fuliginum. Sporae oblongae, vulgo curvatae, apicibus rotundatis obtusisve, 3-septatae, 8-nae aut p. p. 12—16-nae, long. vulgo circ. 0.013—0.014 mm („0.010—0.018 mm“ sec. Nyl.), crass. 0.004—0.005 mm.

Distr. Praesertim ad corticem Populi, saepe etiam Salicis capreae, Alni et Sorbi, rarius Syringae, Viburni et „Fraxini atque Aceris“ (sec. M. Brenner) crescit, nec rara in prov. australibus mediisque Fenniae. LTul.: Ad Tulomajoki (N. I. Fellman). KKER.: Ruankoski (Fellm. l. c. n. 179, Nyl. Lich. Lapp. Or. p. 159). Kb.: Lieksa (Vain. Adj. Lich. Lapp. II p. 13). Sb.: Kuopio (G. Lång Lich. Sav. Bor. p. 35), Neulamäki prope Kuopio (K. Linkola). Tb.: Lohikoski ad Jyväskylä (Vain. Fl. Tav. Or. p. 115). Ta.: Locis numerosis (Vain. l. c., cet.). KON.: Selki, Valkeamäki (Norrl. Fl. Kar. Oneg. II p. 33). Collecta etiam in Sav. austr., Satakunta, Kar. austr. (Vain. Lich. Vib. p. 67), Nylandia (locis numerosis, Hoglandiae haud rara sec. M. Brenner Bidr. Hogl. Lafv. p. 96).

Thallus tenuis aut sat tenuis, continuus aut diffractus aut dispersus, cinereo-albicans aut cinerascens, aut fere evanescens, hypothallo indistincto. Apothecia lat. 0.3—0.5 (—0.7) mm, crebra aut sat dispersa, vulgo opaca. Hypothecium irregulariter plectenparenchymaticum, membranis modice incrassatis, cavitatibus brevibus aut subrotundatis, saepe superne aut inferne rubricoso- aut rufescenti-pallidum ceterumque pallidum. Perithecium inferne pallidum aut totum vel superne rufescens fuscescensve et KHO rubricoso-violascens, hyphis subradiantibus, modice pachydermaticis, cavitatibus brevibus aut subrotundatis. Hymenium 0.055—0.060 mm crassum, parte superiore aeruginosum, KHO sordide subaeruginosum aut parum reagens, jodo „caerulescens, dein sordide violaceo-decoloratum, ascis vinose rubentibus. Paraphyses sat laxae cohaerentes, increbre septatae, crass. 0.0015 mm, apice 0.004—0.005 mm, haud gelatinosae. Asci inflato-clavati, long. 0.040—0.050, crass. 0.015—0.017 mm. Sporae curvatae aut flexuosae aut rectae. Conidangia „immersa, sterigmata simplicia“ (sec. Th. Fr.). Conidia „filiformia, arcuata“ (sec. annot. Nyl.). Gonidia pleurococcoidea, globosa, simplicia diam. 0.007—0.014 mm, saepe bicellulosa aut glomerulosa, valde variabilia.

Obs. 1. *Lecidea arthoniza* Nyl., Lich. Scand. (1861) p. 219, partim ad genus *Naeviae* pertinet (*Arthonia intertexta* β . *pauperrima* S. Almqu. Mon. Arth. Scand., 1880, p. 62), in eodem apothecio *Lecideae goniophilae* ascos breviores, sporis ovoideo-oblongis biseptatis instructos (sine paraphysibus visibilibus *Naeviae*), et alios, sporas simplices ellipsoideas normales *L. goniophilae* foveantes, continens, ut jam indicavit Th. Fr. (Lich. Scand. II, 1874, p. 551), qui idem apothecium scrutavit, quod nunc denuo microscopio examinavi.

Obs. 2. *Bilimbia Bouteillei* Jatta, Fl. It. Crypt. Ital. p. 579, „sporis 1—3-septatis, long. 0.014—0.018, crass. 0.002 mm“ descripta, non est vera *Lecanora Bouteillei* Desmaz. Pl. Crypt. Fr. XXXII (1847) n. 1595, 2:me éd. n. 1195, qui posterior, in herb. Nyl. (n. 18868) bene descriptus sporis 1-septatis, long. 0.009—0.011, crass. 0.003—0.004 mm, conidiis lageniformibus, long. 0.004, crass. 0.001 mm, ad *Catillariam* pertinet (videas sub ea).

5. Sporopodium Mont.

Ann. Sc. Nat. 3. Bot. XVI (1851) p. 54, Syll. Gen. Crypt. (1856) p. 341; Vain. Lich. Ins. Philipp. III (1921) p. 87. *Heterothecium* Flot. Bot. Zeit. 1850 p. 553 p. p.; Mass. Alcan. Gen. Lich. (1853) p. 7, Esam. Alcan. Gen. Lich. (1860) p. 17; Mont. l. c. (1856) p. 341; Müll. Arg. Lich. Beitr. (Fl. 1881) n. 260. *Lopadium* Koerb. Syst. Lich. Germ. (1855) p. 210; Th. Fr. Lich. Arct. (1860) p. 201, Gen. Heterol. (1861) p. 83, Lich. Scand. II (1874) p. 388; Müll. Arg. l. c. n. 268; Zahlbr. Ascol. (1905) p. 137. *Brigantiaea* Trevis. Linnaea 1856 p. 283.

Thallus crustaceus, uniformis, aut raro isidioideus. Sporae vulgo solitariae, rarius — 8:nae, magnae, oblongae ellipsoideaeve aut raro subfusiformes, decolores pallidaeve aut rarius fusciscentes obscurataeve, murali-divisae, vulgo cellulis numerosis, membrana haud gelatinosa. Hymenium jodo reagens. Excipulum variabile, vulgo ex hyphis formatum conglutinatis, raro haud conglutinatis (vel strato stuppeo instructum), gonidiis destitutum. Gonidia cystococcoidea aut pleurococcoidea et in parathallis (cephalodiis) specierum exoticarum scytonemea.

A *Sporopodio* distinguendum est *Myxodictyon chrysostictum* (Tayl.) Mass., Esam. p. 10 (*Lecidea chrysosticta* Nyl. Lich. Nov. Zel. p. 90), hypothecio gonidia continente instructum ceterumque anatomia insigni apotheciorum ab eo differens, et in proximitatem *Haematommae* disponendum.

A. Epithecium KHO non reagens (obscurum aut raro pallidum).

a. Thallus sorediis destitutus.

† Sporae solitariae.

1. **Sp. pezizoideum** (Ach.) Vain. Thallus inaequalis, haud isidiosus. 269.

2. ***Sp. coralloideum** (Nyl.) Vain. Thallus isidiosus. 271.

†† Sporae 8-nae.

Sp. fecundum (Th. Fr.) Vain. Thallus verruculoso-inaequalis. 273.

β. Thallus soralis instructus.

3. **Sp. betulinum** (Hepp) Vain. Sporae 8-nae, cellulis paucis. 273.

B. Apothecia KHO violascentia (aut in specibus exoticis cyanescentia).

Sp. fuscoluteum (Dicks.) Vain. Epithecium fulvescens. Sporae solitariae. 275.

1. **Sp. pezizoideum** (Ach.) Vain.

Lecidea pezizoidea Ach. Lich. Univ. (1810) p. 182, Syn. Lich. (1814) p. 26; Nyl. Lich. Scand. (1861) p. 212. *Heterothecium pezizoideum* Flot. Bot. Zeit. 1850 p. 553; Tuck. Syn. North Am. Lich. II (1888) p. 58. *Lopadium* Koerb. Syst. Lich. Germ. (1855) p. 210; Th. Fr. Lich. Arct. (1860) p. 201, Lich. Spitsb. (1867) p. 34, Lich. Scand. II (1874) p. 389; Arn. Lich. Fragm. 35 Neufundl. (1896) p. 23; A. Sm. Mon. Brit. Lich. II (1911) p. 199.

Thallus crustaceus, inaequalis, esorediatus. Apothecia peltata aut subturbinata, basi bene constricta, disco concavo aut plano, nigro, haud pruinoso, margine concolore aut pallidiore, modice incrassato, persistente. Epithecium fuscescens aut fusco-fuligineum. Hypothecium fuscescens aut pallido-fuscescens. Paraphyses haud ramoso-connexae. Sporae solitariae, decoloratae pallidaeve aut rarius fusco-fuligineae, oblongae, long. 0.048—0.135, crass. 0.020—0.042 mm (—0.046 mm sec. Th. Fr.), murales, cellulis numerosissimis.

Var. **musciicola** (Sommerf.) Vain. *Lecidea musciicola* Sommerf. Vet. Ak. Handl. 1823 p. 113, Suppl. Fl. Lapp. (1826) p. 159. *Lopadium musciicolum* Koerb. Parerg. Lich. 2 Lief. (1860) p. 175. *Lopadium pezizoideum* β. *musciicolum* Th. Fr. Lich. Scand. II (1874) p. 389. *Lecidea pezizoidea* var. *musciicola* Vain. Adj. Lich. Lapp. II (1883) p. 108, Lich. Exp. Vegae Pitkeai (1909) p. 108. *L. pezizoidea* Ach. l. c. (sec. herb. Ach.); Nyl. Lich. Lapp. Or. (1866) p. 156 (excl. var.).

Exs. Sommerf. Pl. Crypt. Norv. I (1826) n. 43 (sec. Th. Fr.). — Zwackh Lich. Exs. (1859) n. 342, (1883) n. 783. — Fellm. Lich. Arct. (1864) n. 167. — Un. Itin. (1867) n. 50. — Arn. Lich. Exs. (1875) n. 636, (1897) n. 636 b. — Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 323. — Malme Lich. Suec. Exs. XI (1912) n. 268. — Zahlbr. Krypt. Exs. Vindob. XXIII (1915) n. 2271.

Muscicola. Thallus verruculoso-inaequalis, subdispersus aut subsquamuloso-diffractus, fuscescens aut olivaceus aut subglauescens. Apothecia vulgo subturbinata, elevata, margine fuscescente aut fusconigricante, prominente aut diu prominente, disco concavo aut demum plano.

Distr. Supra muscos et alias plantas putrescentes in lateribus rupium saxorumque locis subumbrosis subhumidisque et rarius ad terram (conf. infra). LIn.: In reg. betulina ad Kõngäs prope Mare Glaciale, in reg. pinifera nonnullis locis ad Paatsjoki, in reg. subalpina in jugo Suoloselkä (Vain. Adj. Lich. Lapp. II p. 123), Ailigadsch in Utsjoki (F. Silén). LENont.: „Praesertim locis declivibus sat frequens in reg. betulina et reg. alpina inferiore, in campis et jugis siccis cet. in reg. pinifera haud rara et obvia nonnullis locis in reg. abietina“ (Norrl. Ber. Torn. Lappm. p. 337). LMur.: Kljatnji prope Jokonga (N. I. Fellman). LPon.: Ad Ponoï (Fellm. l. c. n. 167). LKem.: Ollostunturi et Pahtarinne prope Kätkesuanto (Norrl.). Kuus.: In reg. subalpina montium Mäntyunturi et Iivaara, in reg. abietina montis Ukonsaara (Vain. l. c.), Kitkajoki et Rukavaara (F. Silén). OKaj.: Kylmäla in Kuhmo (Vain. l. c.). Tb.: Onkisalo in Luhanka (Vain. Fl. Tav. Or. p. 114). KOn.: Perttiniemi (A. Kullhem, n. 18018 in herb. Nyl.). KLad.: Valamo (Norrl. Symb. Fl. Ladog.-Kar. p. 29, mus. Fenn.). Ka.: Vanha-Viipuri (Vain. Lich. Vib. p. 65, Norrl. et Nyl. l. c. n. 323).

Thallus sat tenuis, verruculis depresso-convexis, interdum parum distinctis, hypothallo indistincto. Apothecia lat. 0.7—2 mm, subturbinata aut peltata, disco opaco aut nitido, margine integro, laevigato. Perithecium basim versus circ. 0.070 mm crassum (hypothecio non computato), extus fuscescens, intus decoloratum, ex hyphis radiantibus et ramosoconnexis, pachydermatis, conglutinatis formatum, cavitatibus cellularum elongatis, 0.0015—0.001 mm latis, in margine tenue, fuscescens et membranis sat modice incrassatis et cavitatibus oblongis. Hypothecium superne fuscescens aut dilute pallido-fuscescens, inferne pallidius fuscescens pallidumve, chondroideum, ex hyphis pachydermatis, conglutinatis, irregulariter contextis aut superne ad margines subhorizontalibus formatum. Hymenium circ. 0.120—0.170 mm crassum, jodo lutescens, ascis caerulescentibus aut demum vinose rubentibus, aut totum dilute caerulescens et demum vinose rubens (in specim. Sibir.). Epithecium fuscescens, strato gelatinoso decolorato bene distincto aut evanescente

obductum, nec KHO nec HNO₃ reagens. Paraphyses laxae cohaerentes, vulgo simplices, haud ramoso-connexae, increbre septatae, guttulas oleosas microgonidioideas continentes, crass. 0.0015 mm, apice clavato 0.003—0.004 mm crasso, ad instar calyptrae strato fusco-fuligineo, inferne distincte limitato, dimidia parte superiore obducto. Sporae apicibus rotundatis, haud gelatinosae, long. 0.048—0.135, crass. 0.020—0.042 mm. Conidia minutissima, ellipsoidea (observante Mudd sec. Th. Fr. l. c. p. 390). Gonidia cystococcoidea, globosa—subglobosa, simplicia, diam. 0.008—0.016 mm, chromatophoro centrali, anguloso, vacuolis lateralibus, membranis sat tenuibus aut modice incrassatis.

Var. *disciformis* (Flot.) Koerb. *Heterothecium pezizoideum* β . *disciformis* Flot. Bot. Zeit. 1850 p. 553. *Lopadium pezizoideum* b. *disciforme* Koerb. Syst. Lich. Germ. (1855) p. 210; Th. Fr. Lich. Scand. II (1874) p. 389. *Lopadium disciforme* Kullh. Not. Sällsk. F. Fl. Fenn. XI (1871) p. 275. *Lecidea pezizoidea* var. *disciformis* Vain. Adj. Lich. Lapp. II (1883) p. 123; Nyl. Lich. Jap. (1890) p. 66. *Lopadium pezizoideum* Koerb. Par. Lich. 2 Lief. (1860) p. 175.

Exs. Koerb. Lich. Sel. Germ. II (1856) n. 44 (sec. cit.). — Arn. Lich. Exs. (1878) n. 765 a—c. — Zwackh Lich. Exs. (1881) n. 683. — Lojka Lich. Hung. Exs. II (1882) n. 65. — Malme Lich. Suec. Exs. II (1897) n. 38. — Zahlbr. Krypt. Exs. Vindob. XI (1904) n. 1031.

Corticola. Thallus subareolatus aut rarius verruculoso-inaequalis, glaucescens aut cinereo-glaucescens. Apothecia vulgo peltata, adpressa aut elevata, margine nigricante, vulgo sat tenui et haud prominente, disco plano.

Distr. Ad corticem Abietis excelsae et raro Betulae Juniperique et raro ad lignum in ramis siccis Abietis, praecipue in abiegnis turfosis et abiegnis. N.: Fredriksberg Helsingforsiae (Vain.). Ta.: Locis numerosis in Tammela (A. Kullhem), ad Hersala et Taaveli in Hollola (Vain.), Nyystölä in Padasjoki (Vain.), Evo (J. P. Norrlin). Kb.: In silva Ekypti in par. Lieksa (Vain. Adj. Lich. Lapp. II p. 123). KVien. occ.: Ad Luva-järvi (Vain. l. c.).

Notis internis apotheciorum non differt a var. *musculicola*. Hymenium jodo persistenter caerulescens observatum, sed veris. variabile. Hypothecium fuscescens. Paraphyses haud ramoso-connexae, calyptra fusca instructa. Epithecium strato gelatinoso haud obductum. Sporae solitariae, decoloratae aut pallidae aut fuscantes, long. 0.060—0.078, crass. 0.025—0.030 mm, cellulis numerosissimis.

2. **Sp. coralloideum* (Nyl.) Vain.

Lecidea pezizoidea var. *coralloidea* Nyl. Lich. Lapp. Or. (1866) p. 156, Enum. Lich. Fret. Behr. (1888) p. 47, 54; Vain. Adj. Lich. Lapp. II

(1883) p. 123. *Lopadium pezizoideum* f. *coralloidea* Th. Fr. Lich. Scand. II (1874) p. 300. **Lecidea coralloidea* Vain. Lich. Exp. Vegae Pitlekai (1909) p. 108.

Thallus coralloideo-fruticulosus, isidiosus, isidiis e verruculis thalli enatis, teretibus, fuscescentibus olivaceisve aut cinereo-olivaceis. Apothecia subturbinata aut cupuliformia, elevata, basi bene constricta, margine prominente, persistente, vulgo olivaceo fuscescenteve aut raro pallidiore, disco concavo, atro, nitido, haud pruinoso. Hypothecium fuscescens aut partim pallidum. Epithecium fusco-fuligineum. Sporae solitariae, pallidae aut partim fuscescentes, oblongae, cellulis numerosissimis, long. circ. 0.100—0.115 mm (—0.082 mm sec. Nyl.), crass. 0.020—0.040 mm, murales, cellulis numerosissimis.

Distr. Supra muscos putridos in rupibus et ad alias plantas destructas in paludibus et ad terram humosam in alpibus, raro etiam ad corticem vetustum Alni collectum. In Lapponia Kuollaënsi e Kitofka usque ad Ponoï (N. I. Fellman, sec. Nyl. Lich. Lapp. Or. p. 156), ad Panfelofka (Fellm., sec. herb. Nyl.), ad Orlov („L. pez. f. muscicola“ et „v. coralloidea“ sec. determ. Nyl. in Kihlm. N. Beitr. Flecht. Kola p. 57). LIn.: In reg. pinifera in monte Ruoptuinvaara (Vain.). LEnont.: In reg. alpina in Leutsuvaara prope Kilpisjärvi, Kaaresuanto, Pahtavaara in reg. subsilv. (Norrl. Ber. Torn. Lappm. p. 337). LKem.: Väливаara prope Pallastunturi in Kittilä (Norrl.). KKER.: Ad Kantalahti (G. Selin) et Koutajärvi (Fellm.). Kuus.: Kitkajoki (F. Silén). KOn.: Perttiniemi (A. Kullhem, Norrl.), Schungu („L. pezizoideum“ sec. determ. Nyl. in Norrl. Fl. Kar. Oneg. II p. 32). Ta.: Tianen in Korpi-lahti („L. pezizoidea“ in Vain. Fl. Tav. Or. p. 114).

In **Sp. pezizoideum* transire videtur, thallo interdum tantum partim isidioso. Isidia subeylindrica aut torulosa, simplicia aut ramosa, long. circ. 0.5—2 mm, crass. 0.15—0.1 mm, saepe demum constipata. Apothecia lat. circ. 0.5—1.2 mm, margine saepe inflexo, integro aut raro crenulato. Perithecium fuscescens, intus dilutius coloratum, KHO non reagens, extus praesertimque in margine strato gelatinoso-chondroideo decolore obductum, strato myelohyphico haud instructum. Hypothecium KHO non reagens. Hymenium circ. 0.180 mm crassum,

jodo plus minus caerulescens, dein partim vinose rubens (praesertim asci reagentes). Epithecium fuscofuligineum, strato gelatinoso decolorato obductum, KHO non reagens. Paraphyses haud ramoso-connexae, in crebre septatae, apice clavato 0.002—0.003 mm crasso, ad instar calyptrae strato fuscofuligineo, inferne distincte limitato, dimidia parte totove obducto, in KHO visae laxius cohaerentes (gelatina epitheciali laxiore). Asci membrana fere tota modice incrassata. Sporae apicibus vulgo rotundatis, membrana haud gelatinosa.

Sp. fecundum (Th. Fr.) Vain.

Lopadium fecundum Th. Fr. Lich. Arct. (1860) p. 202, Lich. Scand. II (1874) p. 391; Almqu. Lich. Iakt. Sib. (1879) p. 36, 49; Jatta Fl. It. Crypt. Lich. p. 590; A. Sm. Mon. Brit. Lich. II (1911) p. 200. *Lecidea fecunda* Nyl. in Stizenb. Lich. Helv. (1882) p. 171; Nyl. Enum. Lich. Fret. Behr. (1888) p. 66; Vain. Lich. Exp. Vegae Pittekai (1909) p. 109. *Lopadium sociale* Hepp apud Koerb. Parerga Lich. 2 Lief. (1860) p. 174; Arn. Lich. Tirol X (1873) p. 16 (104), XIII (1874) p. 263, XVIII (1878) p. 257; Müll. Arg. Lich. Beitr. (Fl. 1881) n. 268.

Thallus crustaceus, verruculoso-inaequalis, esorediatus, cinerascens aut albido-cinerascens aut fuscescens, modice incrassatus aut tenuis. Apothecia adpressa et sat late adnata, basi constricta, lat. 0.7—1.5 mm, disco nigro, nudo, concavo aut plano, margine cinereo- aut fusco-nigricante, modice incrassato, vulgo prominente, subpersistente, integro. Hymenium circ. 0.160 mm crassum, jodo caerulescens. Epithecium olivaceo-fuligineum aut „atroviride vel caerulescenti-nigricans et KHO non reagens“ (sec. Arn.). Hypothecium fuscum aut rubricosofuscescens aut „pallide fuscescens“ (sec. Arn.). Paraphyses sat crebre ramoso-connexae. Sporae 8-nae, decolores pallidaeve „aut demum obscuratae“ (sec. Arn.), ellipsoideae oblongaeve, long. circ. 0.028—0.038, crass. 0.016—0.017 mm (long. 0.022—0.050, crass. 0.010—0.020 mm sec. Arn., Th. Fr. et Nyl.), cellulis numerosissimis.

Distr. Supra muscos destructos in regionibus alpinis hyperboreisque in Scandinavia (etiam in Finmarkia orientali) et Sibiria arctica proveniens, in territorio nostro nondum collectum est.

3. Sp. betulinum (Hepp) Vain.

Rhizocarpon betulinum Hepp in Fl. 1862 p. 524 et in Zwackh Lich. Exs. (1859) n. 374; Arn. Lich. Exs. (1865) n. 276 a. *Lecidea betulina* Nyl. Obs. Lich. Pyr. Or. (Fl. 1873) p. 52; Hue Addend. II (1888) p. 222. *Buellia* Th. Fr. Lich. Scand. II (1874) p. 610. *Diplotomma betulinum* Arn. Lich. Tirol XXIII (1887) p. 147, Lich. Fränk. Jur. (Fl. 1885) p. 197, Lich. Münch. (1891) p. 92. *Rhizocarpon efflorescens* Th. Fr. Bot. Not. 1863 p. 10.

Exs. Zwackh l. c. — Arn. Lich. Exs. (1865) n. 276 a, (1875) b. — Malme Lich. Suec. Exs. IV (1898) p. 97.

Thallus crustaceus, sat tenuis aut tenuis, leviter verruculoso-inaequalis, cinereo-glauescens, soraliis instructus, linea hypothallina fusco-nigricante limitatus. Apothecia late adnata, basi leviter constricta, lat. 0.5—2.2 mm, disco nigro, nudo, plano aut demum depresso-convexo, margine modice incrassato aut sat crasso, nigro aut fuscescente, prominente aut rarius demum excluso. Epithecium fuscescens aut raro violaceo-nigricans „aut obscure olivaceum“ (sec. Arn.). Hypothecium fuscescens. Paraphyses haud ramoso-connexae. Sporae 8-nae, fusco-nigricantes, ellipsoideae, long. 0.019—0.024 mm („—0.028 mm“ sec. Arn. et Th. Fr.), crass. 0.010—0.013 mm („—0.015 mm“ sec. Arn.), cellulis paucis.

Distr. Ad corticem Alni, Juniperi, Betulae et raro Sorbi (Abietis, Pini pumilionis, Quercus et ad lignum nudum in terris externis) in turfosis, abiegnis turfosis, lucis et silvis mixtis collectum. Ab.: Hirvensalo (F. Elfving.). N.: Alppila Helsingforsiae (Vain.), Gersterby in Kyrkslätt (G. Lång). Ka.: Nonnullis locis ad Vanhaviipuri et Huusniemi (Vain. Lich. Viburg. p. 68). Ta.: Kesäin in Luhanka, Soima in Korpilahti (Vain. Fl. Tav. Or. p. 117). Tb.: Ad Tourujoki in Jyväskylä (Vain. l. c.). Kar. Vien. occ.: Koroppi (Vain. Adj. Lich. Lapp. II p. 123). OKaj.: Lentiira (Vain.).

Potius sit affine *Sporopodio*, quam *Buelliae* (*Diplotommae*) *alboatrae*, endosporio haud distincte incrassato, hymenio crasso, paraphysibus laxioribus et conidiis fusiformibus a posteriore differens. Conidiis forsitan recedit etiam a *Sporopodio*, in quo conidia ellipsoidea in duabus speciebus cognita sunt. — Thallus soraliis vulgo subrotundatis, cinerascentibus aut glaucescentibus aut albidis, crebris, raro partim confluentibus, farinosis, vulgo planis, haud aut parum prominentibus instructus“, nec KHO nec CaCl_2O_2 reagens“ sec. Arn. Apothecia sat parce evoluta, vulgo dispersa, KHO non reagentia, disco opaco, margine opaco aut leviter nitido, integro. Perithecium fusco-fuligineum, ex hyphis subradiantibus, sat leptodermaticis, conglutinatibus formatum, cavitatibus oblongis, angustis. Hypothecium fuscescens, ex hyphis formatum irregulariter contextis, vix pachydermaticis, conglutinatibus, cavitatibus

angustis. Hymenium circ. 0.120 mm crassum, jodo persistenter sordide caerulescens aut demum vinose rubens. Paraphyses sat laxe cohaerentes, simplices aut parce ramosae, increbre septatae, haud distincte gelatinosae, crass. vix 0.0015 mm, apice capitato-incrassatae (crass. 0.003—0.004 mm), capite obscurato (vulgo fusconigro). Sporae distichae, apicibus obtusis, haud gelatinosae, novellae haud diu decoloratae, septis transversis 2—4, loculis 1—3 bicellulosi, septo sublongitudinali vulgo obliquo, membrana aequali, 8-nae aut abortu 4-nae paucioresve. Conidia fusiformia, recta, apicibus acutis, long. 0.006—0.008, crass. 0.001 mm (sec. annot. et icon. a Nyl. delin. in n. 9518 in herb. Nyl.). Gonidia cystococcoidea, globosa aut subglobosa, simplicia, diam. 0.010—0.006 (—0.004) mm, membrana sat tenui.

Sp. fuscoluteum (Dicks.) Vain.

Lichen fuscoluteus Dicks. Fasc. Sec. Crypt. p. 18, tab. 6 f. 2; Engl. Bot. tab. 1007; Ach. Prodr. Lich. Suec. (1798) p. 72. *Lecidea fuscolutea* Ach. Vet. Ac. Handl. 1808 p. 266, Lich. Univ. (1810) p. 198; Nyl. Lich. Nov. Zel. (1888) p. 90, Lich. Jap. (1890) p. 66; Vain. Lich. Exp. Vegae Pittekai (1909) p. 107. *Lopadium fuscoluteum* Mudd Man. Brit. Lich. (1861) p. 190; Th. Fr. Lich. Scand. I (1871) p. 181, II (1874) p. 388. *Lecanora fuscolutea* Nyl. Enum. Lich. Fret. Behr. (1888) p. 8, 44.

Exs. Dicks. Hort. Sicc. Brit. IV (1793) n. 25 (sec. Leight. Lich. Great Brit. 3 ed. p. 380). — Cromb. Lich. Brit. Exs. I (1874) n. 87. — Havaas Lich. Norv. Exs. (1906) n. 328.

Thallus crustaceus, crassus aut sat tenuis, verruculoso- et verrucoso-inaequalis, verruculis elevatis aut raro depressis, albidus, KHO lutescens, esorediatus. Apothecia subturbinata peltatae, basi bene constricta, lat. 0.8—3 mm, disco plano, subaurantiaco vel fulvo-ferrugineo aut rarius subobscurato, vulgo fulvoferrugineo-pruinoso, raro denudato, margine crasso aut sat crasso, persistente, concolore aut raro pallidiore, vulgo item pruinoso, vulgo prominente. Epithecium fulvescens, KHO violaceo-rubricosum. Hypothecium albidum, superne chondroideum, inferne crebre myelohyphicum. Paraphyses haud ramoso-connexae. Sporae solitariae, decolores, „subellipsoideae oblongaeve, long. 0.048—0.115, crass. 0.024—0.055 mm“ (sec. Th. Fr. et Nyl.).

Distr. Supra muscos et alias plantas in regione subalpina Nordlandiae Finmarkiaeque in Scandinavia provenit, in territorio nostro nondum collectum.

Thallus KHO sat dilute lutescens, addito CaCl_2O_2 intensius lutescit. Hypothallus indistinctus. Apothecia, in verrucis thalli nascentia, strato thallino albedo verrucae accrescente, sed tantum gonidiis emortuis instructo, novella saepe diu subtus obducta, primum zeorina sunt,

interdum adulta quoque zeorina permanentia, ceterumque semper strato inferiore hypothecii ex hyphis crebre contextis, haud conglutinatis, formato, gonidiis autem destituto, praedita. Sic evolutionem in statum lecanorinum accedentem ostendunt. Hypothecium superne chondroideum, hyphis irregulariter contextis, conglutinatis. Perithecium crassum, in margine praesertim extus fulvescens, ceterum subdecoloratum, ex hyphis parum pachydermaticis, leviter irregulariter radiantibus, conglutinatis, formatum, cavitatibus cellularum oblongis aut ellipsoideis subglobosisve, 0.0015—0.001 mm latis, interdum subtus thallo late adnatum. Hymenium circ. 0.140 mm crassum, ascis et circa ascos caeruleis, „dein intense rubens vel fulvescens“ (sec. Th. Fr.). Paraphyses crass. 0.0015 mm, apice gelatinosae et arcte cohaerentes, ceterum laxae cohaerentes et vix distincte gelatinosae, simplices. Conidangia „papillaeformia, pallide aut obscure fusciscentia“. Conidia „ellipsoidea, minutissima, long. 0.00016, crass. 0.0001 unc.“ (Mudd. l. c.). Gonidia cystococcoidea, globosa aut subglobosa, diam. 0.010—0.012 (—0.006) mm, vacuolis lateralibus, membrana sat tenui.

6. *Rhizocarpon* (Ram.) Th. Fr.

Gen. Heterol. (1861) p. 91, Lich. Scand. II (1874) p. 611; Zahlbr. Ascol. (1905) p. 137; Ram. in D.C. Fl. Fr. II (1805) p. 365 (p. p.). *Buellia* **Rhizocarpon* Tuck. Syn. North Am. Lich. II (1888) p. 100.

Thallus crustaceus, uniformis aut rarius ambitu effiguratus. Sporae 8-nae, rarius — solitariae, magnae aut mediocres, ellipsoideae oblongaeve, decolorato aut obscuratae, 1—3-septatae aut murali-divisae, exosporio (vel exteriore parte membranae) gelatinoso decoloratoque. Hymenium jodo reagens. Perithecium vulgo fuligineum, ex hyphis conglutinatis sat leptodermaticis, formatum. Paraphyses ramoso-connexae, membrana gelatinosa. Gonidia cystococcoidea.

Perithecium interdum (in *Rh. umbilicato*, cet.) ex *excipulo* evolutum *thallino*, quod primum extus est obscuratum et intus albidum deindeque totum obscuratum, gonidiis excipuli mox emorientibus. — Papilla, in disco specierum plurium evoluta, analoga est *columellae*, in apotheciis *Thelotrema* saepe proveniente, sed minus constans et saepe defecte evoluta. Apothecia hypothallo affixa aut latere plus minus late cum areolis thallinis aut thallo cingente connata, in nonnullis formis partibus incrassatis thalli immersa et strato thallino imposita.

Sect. I. **Lepidoma**. Sporae septis transversis et longitudinalibus demum murali-divisae aut rarius persistenter 3-septatae. 280.

- 280.
- A. Sporae obscuratae, primum haud diu decoloratae.
- α. Sporae cellulis numerosis aut numerosissimis.
- † Thallus typice lutescens, raro partim subalbidus cinerascensve (aut subcyanescens).
1. **Rh. geographicum** (L.) D.C. Medulla thalli jodo caerulescens.
- †† Thallus fuscescens aut olivaceus aut cinerascens albidusve.
- § Thallus areolis squamisve rufescentibus, margine pallidiore.
3. **Rh. leptolepis** Anzi. Thallus jodo non reagens. 285.
- §§ Thallus verrucis areolisque unicoloribus.
- △ Medulla thalli jodo caerulescens.
4. **Rh. grande** (Floerk.) Arn. Thallus KHO non rubescens. Sporae 8:nae. 286.
5. ***Rh. eupetraeum** (Nyl.) Arn. Thallus KHO lutescens deindeque rubescens. Sporae 8:nae. 288.
- △△ Medulla thalli jodo non reagens.
7. **Rh. concretum** (Ach.) Elenkin. Sporae singulae aut binae. 290.
8. ***Rh. phalerospora** Vain. Sporae typice 8:nae — binae et singulae in eodem apothecio. 292.
- β. Sporae diu 3-septatae, demum submurales, cellulis paucis.
2. **Rh. viridiatrum** (Floerk.) Koerb. Thallus flavescens aut demum glaucescens cinerascensve. 283.
- B. Sporae persistenter decoloratae aut primum diu decoloratae et demum obscuratae.
1. Sporae demum septis transversis et longitudinalibus divisae.
- † Sporae murales (loculi sporarum septis longitudinalibus duobus aut pluribus divisi).
- Perithecium margine primum intus albido deindeque obscurato.
- Rh. umbilicatum** (Ram.) Jatta. 294.
- Perithecium margine intus saltem partim mox fuligineo.
- ✕ Thallus distinctus vel bene evolutus.
- ⊖ Epithecium olivaceum aut hymenium parte superiore aeruginosum, KHO haud rubricosum.

× Sporae 4:nae aut binae.

6. *Rh. phaeolepis* Vain. 290.

×× Sporae 8:nae.

9. *Rh. concentricum* (Dav.) Vain. Apothecia thallo immersa, haud papillata. 295.

10. *Rh. obscuratum* (Ach.) Mass. Apothecia demum prominentia, saepe papillata. 297.

⊖⊖ Epithecium rubricosum fuscescensve, KHO pulchre rubricosum.

11. **Rh. orphninum* Vain. Thallus areolatus aut verrucosus. 301.

12. *Rh. porphyrostrotum* Vain. Thallus verruculis minutis. 302.

×× Thallus evanescens, verruculis minutissimis.

13. *Rh. lapillorum* Vain. Epithecium rubricosum. 303.

14. *Rh. anaperum* Vain. Epithecium viridi-olivaceum. 304.

†† Sporae submurales (loculi sporarum uno septo longitudinali divisi).

§ Apothecia pruinosa.

- Rh. roridulum* Th. Fr. Epithecium rubricosum. 305.

§§ Apothecia haud pruinosa.

× Apothecia aspicilioidea, thallo immersa.

- Rh. amphibium* (Fr.) Th. Fr. 306.

×× Apothecia haud aspicilioidea, habitu lecideina.

△ Thallus ochraceus.

15. *Rh. Oederi* (Web.) Koerb. Epithecium subcaeruleo-nigricans. 307.

△△ Thallus haud ochraceus.

× Thallus KHO lutescens deindeque rubescens.

16. *Rh. plicatile* (Leight.) A. Smith. Thallus jodo non reagens. 308.

×× Thallus KHO non reagens.

○ Thallus jodo leviter reagens.

17. *Rh. distinctum* Th. Fr. Thallus tenuis, areolis minutis. 310.

18. *Rh. hyalescens* Vain. Thallus sat crassus aut modice incrassatus. 312.

○○ Thallus jodo non reagens.

⊖ Thallus cinerascens aut cinereo-fuscescens.

19. *Rh. reductum* Th. Fr. Epithecium aeruginosum aut olivaceum. 313.

⊖⊖ Thallus impure albidus.

20. **Rh. postumum** (Nyl.) Th. Fr. Apothecia lat. 0.2—0.3 mm. Sporae long. 0.014—0.017 mm. 314.

Rh. subpostumum (Nyl.) Arn. Apothecia lat. 0.6—0.4 mm. Sporae long. 0.018—0.022 mm. 317.

2. Sporae septis transversis 3 divisae.

† Apothecia sat parva, lat. 0.5—0.8 mm.

21. **Rh. subreductum** Vain. Thallus areolatus, areolis contiguus. 315.

22. **Rh. submodestum** Vain. Thallus verruculis minutissimis, parcissimis indicatus. 315.

†† Apothecia minutissima, lat. 0.25—0.3 mm.

23. **Rh. tetramerum** Vain. Thallus areolis minutis, dispersis. 316.

Sect. II. **Catocarpus**. Sporae persistenter 1-septatae. 317.

A. Sporae maturae omnes obscuratae.

a. Thallus typice lutescens, raro partim albidus.

† Medulla thalli jodo caerulescens.

24. **Rh. chionophiloides** Vain. Thallus KHO rubescens (aut raro tantum addito CaCl_2O_2 rubescens). 317.

Rh. superficiale (Schaer.) Vain. Thallus KHO non reagens. 319.

†† Medulla thalli jodo non reagens.

26. **Rh. chionophilum** Th. Fr. Thallus KHO rubescens. 320.

27. **Rh. oreites** Vain. Thallus KHO non reagens. 322.

β. Thallus fuscescens aut cinerascens aut albidus.

✕ Thallus peltato-squamosus.

28. **Rh. Rittokense** (Hellb.) Th. Fr. Thallus fuscescens rufescensve, margine cinerascente nigricanteve. 324.

✕✕ Thallus areolatus verrucosusve.

✕ Medulla thalli KHO haud distincte rubescens.

△ Medulla thalli KHO non reagens.

29. **Rh. badioatrum** (Floerk.) Th. Fr. Epithecium rubricosum, KHO distinctius rubricosum. 325.

△△ Medulla thalli KHO lutescens.

30. **Rh. Copelandi** (Koerb.) Th. Fr. Epithecium vulgo olivaceum aeruginosumve, KHO distinctius aeruginosum. 329.

32. **Rh. cinereonigrum** Vain. Epithecium rubricosum. 332.

✕✕ Medulla thalli KHO rubescens.

31. **Rh. hyperboreum** Vain. Thallus cinereus, haud pruinosus. Epithecium aeruginosum. Perithecium KHO crystallina rubra formans. 331.

25. **Rh. Inarense** Vain. Thallus albidus, subpruinosis. 319.

B. Sporae persistenter decoloratae aut diu decoloratae et demum dilute obscuratae.

○ Medulla thalli jodo non reagens.

33. **Rh. Hochstetteri** (Koerb.) Vain. Thallus KHO non reagens. Epithecium olivaceum aut aeruginosum. 332.

34. **Rh. cinereovirens** Müll. Arg. Medulla thalli KHO rubescens. 336.

○○ Medulla thalli jodo caerulescens.

35. **Rh. polycarpum** (Hepp) Th. Fr. Epithecium fuliginosum aut rubricosum fuscescensve, KHO rubricosum. 338.

Sect. I. **Lepidoma** (Link) Vain.

Lepidoma Link Nov. Pl. Gen. in Schrad. N. Journ. Bot. 3 B. (1809) p. 5. *Abacina* b. *Mykoclamys* Norm. Con. Praem. Gen. Lich. (1852) p. 24. *Rhizocarpon* a. *Eurhizocarpon* Stizenb. Beitr. Flechtensyst. (1862) p. 160; Th. Fr. Lich. Scand. II (1874) p. 621.

Sporae demum murali-divisae aut rarius persistenter 3-septatae.

1. **Rh. geographicum** (L.) D.C.

Fl. Fr. II (1805) p. 365; Koerb. Syst. Lich. Germ. (1855) p. 262; Th. Fr. Lich. Arct. (1860) p. 236, Lich. Scand. II (1874) p. 622; Arn. Lich. Fragm. XII (Fl. 1871) p. 150, Lich. Münch. (1891) p. 93. *Lichen geographicus* L. Spec. Plant. II (1753) p. 1140. *Lecidea geographica* Ach. Meth. Lich. (1803) p. 45, Lich. Univ. (1810) p. 163, Syn. Lich. (1814) p. 21; Nyl. Lich. Scand. (1861) p. 248; Vain. Exp. Antarkt. Belg. Lich. (1903) p. 31, Lich. Exp. Vegae Pitlekai (1909) p. 110.

Exs. Fr. Lich. Suec. Exs. XIII (1827) n. 386. — Leight. Lich. Brit. Exs. IV (1853) n. 128, 129. — Nyl. Lich. Mont-Dor. (1856) n. 59. — Fellm. Lich. Arct. (1864) n. 203. — Nyl. Lich. Pyr. Or. (1872) n. 47. — Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 347, 348. — Havaas Lich. Norv. Exs. (1901) n. 47. — Malme Lich. Suec. Exs. IX (1911) n. 7.

Thallus crustaceus, uniformis, vulgo areolatus, areolis planis aut convexis, vulgo laevigatis, vulgo citrinis flavescensve, raro p. p. cinerascensve albidisve aut sub-

cyanescentibus, esorediatis, medulla alba, jodo caerulescente, hypothallo nigro. Apothecia nigra, nuda, disco plano, margine tenui aut sat tenui. Sporae 8:nae, maturae nigrae muralesque, cellulis haud numerosis.

Distr. Supra rupes et lapides saxaque, praesertim granitica, locis apricis frequenter toto territorio, etiam in omnibus regionibus Lapponiae (Norrl. Ber. Torn. Lappm. p. 341, Vain. Adj. Lich. Lapp. II p. 133, Nyl. Lich. Lapp. Or. p. 166).

Thallus modice incrassatus aut sat tenuis aut raro partim crassus aut evanescens, vulgo areolatus, areolis contiguis aut dispersis, aut raro continuus et leviter rimosus, haud soresiosus, nec KHO, nec CaCl_2O_2 reagens, acidum rhizocarpicum et psoromicum (sec. Hesse Journ. Prakt. Chem. 58, 1899, p. 626, et Zopf Flechtenst., 1907, p. 402) et interdum barbatum sive rhizonicum (sec. Hesse l. c. p. 427, et l. c. 68, 1903, p. 14, conf. Zopf l. c. p. 238, 402) continens. Apothecia haud aut parum prominentia, lat. circ. 1—0.5 mm, hypothallo aut strato gonidioso imposita. Perithecium ex hyphis radiantibus, sat leptodermaticis, conglutinatis, formatum, cavitatibus ellipsoideis oblongisve, 0.003 mm latis, intus partim subalbidum, extus rubricosus-fuscofuligineus, KHO demum leviter rubricosus. Hypothecium fuscofuligineum, KHO demum leviter rubricosum aut parum reagens, ex hyphis erectis, sat leptodermaticis, conglutinatis, formatum. Hymenium circ. 0.150—0.180 mm crassum, jodo persistenter caerulescens. Epithecium sordide aeruginoso-nigricans (f. *epichlorotica*) aut olivaceum pallidumve (Vain. Lich. Exp. Vegae Pitlekai p. 110) aut vulgo fusco-vel rubricosus-fuligineus et KHO violaceo-purpureus. Paraphyses gelatinam haud abundantem, in KHO demum turgescens, e strato exteriori membranae verisimiliter formatam, percurrentes, ramoso-connexae, sat crebre septatae, crass. 0.002 mm, apice 0.0025—0.004 (—0.005) mm, membrana tenui, distincta. Sporae typice 8:nae, abortu saepe pauciores, primum 3—4-septatae, demum murales, cellulis haud numerosis, strato gelatinoso tenuiore crassioreve decolorato praesertim primum indutae, long. circ. 0.024—0.035, crass. 0.011—0.014 mm (halone non computato), sec. Hepp Flecht. Eur. n. 152 long. „—0.050 mm“. Conidangia „minutissima, subverrucaeformia, semiimmersa, nigra, solitaria aut aggregata aut interdum confluentia, praesertim ambitum versus thalli disposita aut pone marginem areolarum“ (sec. Mudd Man. Brit. Lich. p. 221). Sterigmata simplicia (sec. Linds. l. c. p. 270) aut parum septata (sec. Flagey Fl. Lich. Franche-Comté p. 493). Conidia cylindrica,

recta aut rectiuscula, long. 0.008—0.009 mm (sec. Flag. l. c., Linds. l. c. p. 270, tab. 13 f. 13, Th. Fr. l. c., Arn. l. c.). Gonidia cystococcoidea, globosa, simplicia, diam. 0.006—0.016 mm, membrana incrassata aut sat tenui, interdum autosporas continentia.

F. contigua Schaer. *Lecidea geographica* *a. contigua* Schaer. Lich. Helv. Spic. III (1828) p. 124, IV (1833) p. 193, Lich. Helv. Exs. VII (1828) n. 172.

Thallus areolis contiguus.

Distr. Frequenter proveniens.

F. atrovirens (L.) Schaer. *Lichen atrovirens* L. Spec. Plant. II (1753) p. 1141. *Lecidea geographica* *β. atrovirens* Schaer. Lich. Helv. Spic. III (1828) p. 124, IV (1833) p. 193.

Thallus areolis p. p. discretis, hypothallo nigro disjunctis.

Distr. Haud rara.

F. gerontica (Ach.) Th. Fr. Lich. Scand. II (1874) p. 622. *L. atrovirens* *β. L. gerontica* Ach. Meth. Lich. (1803) p. 45.

Thalli areolae albiae aut p. p. flavae, contiguae.

Distr. LENONT.: Haud rara in reg. alp. sec. annot. Norrl. (Ber. Torn. Lappm. p. 341). OKAJ.: Ad saxa granit. in Lehtovaara in Kianta (Vain. Adj. Lich. Lapp. II p. 133). KON.: In saxo diorit. ad Perttiniemi (Th. Simming). TA.: Tiirismaa (Norrl. Fl. Tav. Or. p. 192).

F. cyanodes (Nyl.) Vain. *L. geogr. f. cyanodes* Nyl. in Gasil. Centr. (1898) p. 58; Boistel N. Fl. Lich. II (1900) p. 242.

Thalli areolae cyanescentes, parce etiam flavae, contiguae.

Distr. Ad saxum graniticum in Tervaniemi Viburgi (Vain.).

F. lecanora (Floerk.) Vain. *Lecidea atrovirens* *δ. Lecanora* Floerk. Deutsch. Lich. IV (1819) p. 4, n. 63. *Rhizocarpon geogr. β. lecanorinum* Koerb. Syst. Lich. Germ. (1855) p. 263. *L. geogr. var. lecanorina* Nyl. Lich. Paris (1896) p. 102. *L. geogr. var. cyclopica* Nyl. Lich. Scand., (1861) p. 248; Norrl. et Nyl. Herb. Lich. Fenn. n. 348.

Thalli areolae p. p. discretae, apotheciis solitariis, immersis, habitu fere lecanorinis.

Distr. Helsingforsiae (W. Nylander, J. P. Norrlin).

F. subcinerascens (Nyl.) Deichm. Branth Till. Groenl. Lich. (1892) p. 755. *L. geogr. f. subcinerascens* Nyl. Enum. Lich. Fret. Behr. (1888) p. 39; Vain. Lich. Exp. Vegae Pitlekai (1909) p. 110.

Thallus areolis albidis cinerascensibusve aut raro p. p. etiam flavidis, hypothallo nigro bene evoluto aut evanescente. In specim. orig. Sibirico areolae sunt dispersae, in specim. e territorio nostro contiguae aut p. p. dispersae.

Distr. LMur.: Ad saxum granit. in Olenji (N. I. Fellman). OKaj.: Supra rupem silaceam in Vuokatti in par. Kuhmo (F. Silén).

In his speciminibus epithecium dilute fuscescens aut subolivaceum, hymenio superiore ceterum dilute aeruginoso. In specim. orig. Nylanderiano epithecium olivaceum, hymenio ceterum dilute aeruginoso. — Ab hac forma forsitan non differt *Rh. geogr. c. dealbatum* Bagl. et Car. Anacr. Lich. Vals. II (1881) p. 277, Jatta Fl. It. Crypt. Lich. p. 693.

Obs. *Lecidea geographica* γ. *pulverulenta* Schaer. Lich. Helv. Spic. III (1828) p. 124, Lich. Helv. Exs. XXV (1852) n. 624, „areolis discretis, pulvere albido suffusis“ descripta, ad saxa calcaria in Helvetia collecta, sorediis non sit instructa et forsitan recte a Nyl. in Lich. Scand. p. 248 ad f. *geronticam* adjungitur. — *L. geographica* η. *conglomerata* Schaer. Lich. Helv. Exs. XXIII (1849) n. 577, Enum. Lich. Eur. (1850) p. 106, „areolis discretis vel conglobatis, tumidis, leproso-pulverulentis, apotheciis primum lividis, dein atris, immarginatis“ descripta, sec. Anzi Lich. Min. Rar. It. VII (1865) n. 304 est forma areolis convexis, haud sorediosis instructa, proxima f. *atrovirenti*, locis numerosis collecta (apotheciis atris). *L. geographica* ε. *conglomerata* Fr., Lich. Eur. Ref. (1831) p. 327, sec. cit. spectat ad *L. atrovirentem* β. *alpicolam* Wahlenb. (Fl. Lapp., 1812, p. 474), quae sec. Th. Fr. Lich. Scand. p. 623 proxima est f. *atrovirenti* (L.) Schaer., „crusta melius evoluta, areolis applanatis, subrugosis, supra hypothallum atrum sparsis“.

2. *Rh. viridiatrum* (Floerk.) Koerb.

Syst. Lich. Germ. (1855) p. 262; Arn. Lich. Tirol IV (1869) p. 615, XXIII (1887) p. 92, Lich. Fragm. (Fl. 1871) p. 151; Th. Fr. Lich. Scand. II (1874) p. 623; Lettau Beitr. Lich. Ost- Westpreuss. (1914) p. 29; A. Smith Mon. Brit. Lich. II (1911) p. 192; Jatta Fl. It. Crypt. Lich. p. 694. *Lecidea viridiatra* Floerk. Deutsch. Lich. 4 (1819) p. 4; Flot. Lich. Schles. (1829) p. 9; Nyl. Lich. Scand. (1861) p. 248 (p. p.), Fl. 1881 p. 533, Lich. Paris (1896) p. 102; Hue Addend. II (1886) p. 239. *L. petraea* v. *viridiatra* Flot. Bot. Zeit. 1828 p. 691. *Lichen viridiater* Wulf. in Jacq. Collect. II (1788) p. 186 n. 83 (forsan huc pertinet sec. Arn. Zur Erinn. Wulf., 1882, p. 150, conf. Ach. Syn. Lich. p. 21, Th. Fr. l. c. p. 533). *Lecidea geographica* f. *sphaerica* Leight. Lich. Great Brit. ed. 3 (1879) p. 373 (sec. exs. cit.), haud Schaer. Lich. Helv. Spic. III (1828) p. 124, IV (1833) p. 193.

Exs. Flot. Lich. Exs. (1829) n. 192. — Zwackh Lich. Exs. (1852) n. 139. — Leight. Lich. Brit. Exs. III (1852) n. 93. — Koerb. Lich. Sel. Germ. IV (1856) n. 108. — Anzi Lich. Sondr. ser. II VIII n. 204, Lich. Exs. Min. Rar. It. VII (1865) n. 305. — Arn. Lich. Exs. (1882) n. 943 a, (1895) b. — Lojka Lich. Hung. Exs. II (1882) n. 91. — Claud. et Harm. Lich.

Gall. Exs. VI (1904) n. 297. — Zahlbr. Krypt. Exs. Vindob. XIII (1905) n. 1236. (P. p. sec. cit.)

Thallus crustaceus, uniformis, verrucosus areolatusve, areolis contiguus aut rarius partim subdispersis (vel in var. bene dispersis), convexus aut partim sat planis, flavescentibus aut demum glaucescentibus cinerascentibusve, KHO superne intusque non reagentibus, esorediatis, intus stramineo-flavescentibus, jodo non reagentibus, hypothallo evanescente aut rarius (in v. *Oportensi*) bene evoluto nigricanteque. Apothecia nigra, nuda, plana aut demum convexa, immarginata aut primum tenuiter marginata, sat parva. Sporae 8-nae, demum fuligineae, diu 3-septatae, demum submurales, long. 0.022—0.027 mm aut sec. annot. Nyl. „long. 0.018—0.025, crass. 0.008—0.012 mm“, cellulis paucis.

Distr. Ad saxa gneissacea et granitica rarissima. Ab.: Karjalohja (J. P. Norrlin, n. 10488 in herb. Nyl.). Ta.: In littore lacus Päijänne prope Tientaali in Luhanka (Vain. Fl. Tav. Or. p. 117).

Praecipue thallo intus stramineo-flavescente (jodo haud caerulescente) et extus saepe (praesertim in natura) flavido et cellulis sporarum constanter paucis a *Rh. geographico* et *Rh. grandi* distinguitur. Thallus persistenter flavidus (talibus adhuc in Flot. Lich. Exs. n. 192 in herb. Nyl.) aut saepius colore alternans, ita ut primo aspectu subflavescens appareat deindeque mox distincte cinerascens videatur, quae insignis mutatio coloris praesertim tempestate serena observatur, areolis circ. 0.4—1.3 mm latis, acidum rhizocarpicum continens sec. Zopf (Ann. Chem. B. 313 p. 334, Flechtenst., 1907, p. 402). Apothecia late adnata, basi haud constricta, thallo immersa aut inter areolas sita aut raro leviter prominentia. Perithecium tenue, fuligineum. Hypothecium rubricosum-fuscescenti-fuligineum, KHO purpureum. Hymenium circ. 0.100—0.120 mm crassum, jodo persistenter caerulescens. Epithecium fuligineum, KHO purpurascens. Paraphyses ramoso-connexae, gelatinam parcam percurrentes, cellulis oblongis, apice incrassatae. Sporae strato gelatinoso tenuiore crassioresve, decolorato indutae, oblongae ellipsoideaeve, apicibus rotundatis, 1—3-septatae, loculis (1—3) septo uno longitudinali divisis. Gonidia cystococcoidea, globosa, diam. 0.009—0.018 mm, chromatophoro difformi, anguloso, vacuolis lateralibus, membrana sat tenui, nonnulla autosporas haud valde numerosas, subglobosas, diam. 0.004—0.006 mm continentia.

Obs. Specimina in Fennia collecta thallo demum cinerascente instructa sunt. In var. **Oportensi** Vain. areolae thalli maxima parte dispersae, pulchre flavae, hypothallo nigro inter areolas bene evoluto, apothecia prominentia. Ad Oporto in Lusitania ab I. Newton collecta (10492 in herb. Nyl.).

3. *Rh. leptolepis* Anzi

Manip. Lich. Rar. (1862) p. 29 (nomen nud.), Lich. Rar. Langob. Exs. IX (1863) n. 361; Arn. Lich. Fragm. XII (Fl. 1871) p. 149, Lich. Tirol XVIII (1878) p. 268, XIX p. 288 (haud *Lecidea leptolepis* Bagl. et Carest. Alcum. Lich. Vals. in Comment. Soc. Crittog. Ital. II, 1864, p. 83). *Lecidea atroalba* γ. *amphibia* Hepp Flecht. Eur. I (1853) tab. VI n. 38 (haud Fr.). *Rhizocarpon amphibium* Koerb. Syst. Lich. Germ. (1855) p. 264. *Rh. petraeum* α. *vulgare* 5. *protothallinum* Koerb. Parerg. Lich. 3 Lief. (1861) p. 231 p. p. *Lecidea atrobrunnea* Nyl. sec. Brenn. in Not. Sällsk. F. et Fl. Fenn. XII I (1874) p. 458. „*Rh. grande forma*“ Th. Fr. Lich. Scand. II (1874) p. 625. *L. atrobrunneola* Nyl. Fl. 1876 p. 239. *L. leptolepis* f. *atrobrunneola* Nyl. in Brenner Bidr. Høgl. Lafv. (1885) p. 113.

Exs. Hepp Flecht. Eur. I (1853) n. 38 (sec. Arn.). — Anzi Lich. Rar. Langob. Exs. IX (1863) n. 361 (in herb. Nyl.). — Erb. Critt. Ital. XIX (1880) n. 927 (sec. Jatta Fl. It. Crypt. Lich. p. 691).

Thallus areolis supra hypothallum nigrum dispersis, rotundatis, sat parvis, rufescentibus aut persicino-testaceis, haud pruinosis, margine vulgo cinerascens aut pallidioribus, planis aut leviter convexis, adnatis aut basi leviter constrictis et subsquamaeformibus, jodo non reagentibus. Apothecia sat parva aut rarius mediocria, inter verruculas thalli sita, nigra, nuda, primum plana, margine tenui, dein convexa immarginataque. Epithecium rubricosum aut rubricosofuligineum (aut olivaceum sec. Arn.). Sporae 8-nae, maturae obscuratae, „long. 0.027—0.034 mm, crass. 0.011—0.014 mm“ (in specim. Fennic. sec. Nyl.) aut „long. 0.034—0.042, crass. 0.015—0.022 mm“ (in specim. Tirolis sec. Arn.), murales, cellulis numerosissimis numerosisve.

Distr. Supra rupes porphyricas in Kotikallio et in saxis littoralibus ad Mustjyrkänvuori Hoglandiae cum **Lecanora Swartzii*, *Rh. geographico* et *Parm. omphal. v. pannif.* (M. Brenner l. c.).

Thallus areolis 0.4—0.3 (0.2—0.6) mm latis, nec KHO nec CaCl_2O_2 reagentibus (Arn.), laevigatis, nitidis aut opacis, microscopio visis jodo non distincte reagentibus, etsi sectio thalli, hypothallum obscuratum et superficiem fusciscentem et gonidia in jodo (exsiccata) rubricosa continens, facile ut jodo reagens habeatur. Apothecia sat crebra aut dispersa, lat. 0.4—0.7 (—1) mm, haud papillata, late adnata, basi saepe demum leviter constricta. Perithecium subrubricoso-fuligineum, KHO distinctius purpureum. Hypothecium rubricoso-fuligineum, sicut etiam epithecium KHO distinctius purpureum. Hymenium circ. 0.110 mm crassum. Sporae strato gelatinoso sat crasso. Conidia „breviter acicularia, long. 0.006—0.009 mm“ (sec. Jatta Fl. It. Crypt. Lich. p. 691). Gonidia cystococcoidea, globosa, diam. 0.008—0.014 mm, vacuolis lateralibus, membrana sat tenui, interdum autosporas nonnullas continentia.

Obs. *Lecidea leptolepis* f. *atrobrunneola* Nyl. l. c., thallo interdum jodo nonnihil caerulescente descripta est (conf. supra).

4. *Rh. grande* (Floerk.) Arn.

Lich. Fragm. XII (Fl. 1871) p. 149; Th. Fr. Lich. Scand. II p. 624. *Lecidea petraea* β . *fuscoatra* C. *grandis* Floerk. Fl. 1828 p. 620 sec. Arn. l. c. (Floerk. Lich. Exs., 1829, n. 173 A p. p. etiam ad „*L. Montagnei*“ pertinet sec. Nyl. Fl. 1881 p. 188). *L. grandis* Vain. Exp. Antart. Belg. Lich. (1903) p. 32, Lich. Exp. Vegae Pitlekai (1909) p. 111. *L. petraea* Nyl. Fl. 1870 p. 36 (haud *Lichen petraeus* Wulf. Winterbel., 1787, p. 90 sec. Arn. Zur Erinn. Wulf. in Verh. Z.-B. Ges. Wien 1882 p. 157). *Lecidea parapetraea* Nyl. Fl. 1881 p. 188, Hue Add. II (1888) p. 216; Hue Exp. Antart. Franç. Lich. (1908) p. 16. *Lichen atroalbus* Ach. Prodr. Lich. Suec. (1798) p. 63 p. p. (sec. Th. Fr. l. c. p. 625).

Exs. Fr. Lich. Suec. Exs. XIV (1833) n. 406 B. — Sommerf. Pl. Crypt. Norv. II (1836) n. 128. — Malme Lich. Suec. Exs. VII (1910) n. 172.

Thallus crustaceus, uniformis, verrucosus, verrucis plus minus dispersis, convexis, laevigatis, cinereo-fuscescentibus aut cinerascentibus aut subalbidis, haud pruinosis, esorediatis, KHO non reagentibus, medulla alba, jodo subcaerulescente, hypothallo nigro. Apothecia nigra, nuda, primum plana et tenuiter marginata, saepe demum convexa immarginataque, haud papillata, sat parva aut mediocria. Hypothecium fuscum. Sporae 8-nae, demum nigricantes, murali-divisae, long. 0.024—0.046, crass. 0.011—0.018 mm, cellulis numerosis aut sat paucis.

Distr. Ad rupes et saxa, praesertim granitica et silacea, locis apricis et ad lapides in silvis frequenter per totum territorium et in omnibus regionibus (Norrl. Ber. Torn. Lappm. p. 340, Vain. Adj. Lich. Lapp. II p. 135, Nyl. Lich. Lapp. Or. p. 162, Kihlm. N. Beitr. Flecht. Kola p. 59).

F. fuscescens (Leight.) Vain. *L. petraea* f. *fuscescens* Leight. Lich. Great Brit. 3 ed. (1879) p. 376; Vain. Adj. Lich. Lapp. II (1883) p. 136.

Thallus verrucis cinereo-fuscescentibus, KHO non reagentibus, addito CaCl_2O_2 intus subfulvescentibus, medulla jodo leviter aut rarius intense caerulescente. Epithecium subviolaceo-fuligineum, KHO distinctius violascens.

Distr. Sat frequens.

F. parapetraea (Nyl.) Vain. (Exp. Antarct. Belg. Lich. p. 32, *L. atroalba* β . *vera* Naeg. man. in Hepp Flecht. Eur. I, 1853, n. 37 sec. Stizenb. Lich. Helv. I p. 200) verrucis KHO cum CaCl_2O_2 intus rubescentibus ab hac forma differt. In Fennia nondum collecta.

F. atrocaesia (Nyl.) Blomb. et Forssell Enum. Pl. Scand. (1880) p. 94. *L. petraea* f. *atrocaesia* Nyl. Fl. 1876 p. 239. *L. parapetraea* **atrocaesia* Nyl. Enum. Lich. Fret. Behr. (1888) p. 15. *L. atrocaesia* Nyl. l. c. p. 51.

Thallus verrucis cinereis, circ. 0.2—0.3 mm latis, KHO non reagentibus, addito CaCl_2O_2 intus rubescentibus. Epithecium rubricosum aut subviolaceo-fuligineum, KHO distinctius violascens.

Distr. Frequens.

F. petraeiza (Nyl.) Vain. *L. petraeiza* Nyl. Fl. 1879 p. 221. *L. grandis* f. *petraeiza* Vain. Lich. Caucas. p. 319, Lich. Exp. Vegae Pitlekai p. 112. *L. petraea* γ . *pusilla* Hepp Flecht. Eur. II (1857) n. 314.

Thallus verrucis subcinerascentibus, nec KHO, nec CaCl_2O_2 reagentibus, medulla jodo leviter caerulescente. Epithecium subviolaceo-nigricans, KHO distinctius violaceum.

Distr. Supra lapidem graniticam ad Nikola in KOL. (F. Elfving).

F. Elfvingii Vain.

Thallus verrucis subcinerascentibus, in solutione jodetica haud distincte reagentibus, sed demum exsiccatis dilute violascentibus, KHO cum CaCl_2O_2 rubescentibus. Epithecium atrum, KHO subviolaceo-fuligineum.

Distr. Supra lapidem graniticam ad Stjeliki in KOL. (F. Elfving).

F. epichlora Vain. *L. petraea* f. *epichlora* Vain. Adj. Lich. Lapp. II (1883) p. 136. *L. grandis* f. *epichlora* Vain. Lich. Exp. Vegae Pitlekai, (1809) p. 111.

Thallus verrucis cinerascentibus, KHO non reagentibus, CaCl_2O_2 non reagentibus (in specim. Fenn.) aut leviter rubescentibus (p. p. in specim. Sibir.), his solutionibus unitis melius rubescentibus, medulla jodo leviter caerulescente. Epitecium smaragdulo-fuligineum aut sordide olivaceo-smaragdulum aut dilute olivaceum, KHO distinctius smaragdulum aut haud reagens. Excipulum sordide violaceo-fuligineum, KHO pulchrius purpureum.

Distr. In latere rupis ad paludem turfosum prope Lehtovaara in par. Kianta (Vain.).

F. apopetraeoides Vain. (Lich. Exp. Vegae Pitlekai p. 111) verrucis KHO et CaCl_2O_2 unitis non reagentibus aut KHO solo intus leviter lutescentibus ab hac forma recedit.

F. cinereobullata (Vain.) Blomb. et Forss. En. Pl. Scand. (1880) p. 94. *L. petraea* var. *cinereobullata* Vain. Lich. Vib. (1878) p. 60.

Thallus verrucis p. p. majoribus (2—0.5 mm latis), cinerascentibus, KHO extus non reagentibus, intus leviter flavescentibus, CaCl_2O_2 non reagentibus, his solutionibus unitis intus bene rubescentibus. Epitecium violaceo-fuligineum. Hypothecium fuscum. Sporae long. circ. 0.030, crass. 0.012 mm, septis transversis circ. 4, loculis mediis bicellulosis, demum nigricantes. Medulla jodo haud intense caerulescens.

Distr. In lateribus saxorum ad litus maris prope Sacerdotium pone Viburgum (Vain.).

Proxima f. *atrocaesia* (Nyl.).

Obs. Rh. endamyleum Th. Fr., Lich. Scand. II (1874) p. 627, tantum medulla thalli jodo caerulescente a *Rh. grandis* differe indicatur, sed etiam in hoc posteriore medulla jodo leviter aut bene caerulescit, quare hae species non distinguendae sunt.

5. **Rh. eupetraeum* (Nyl.) Arn.

Lecidea eupetraea Nyl. Fl. 1870 p. 36; Hue Addend. II (1888) p. 217. *L. petraea* **L. eupetraea* Vain. Adj. Lich. Lapp. II (1883) p. 136. *Rh. grande* f. *eupetraea* Th. Fr. Lich. Scand. II (1874) p. 624. *Rh. eupetraeum* Arn. Labrador (1896) p. 16.

Exs. Malme Lich. Suec. Exs. I (1897) n. 14. -- Havaas Lich. Norv. Exs. (1913) n. 424.

Thallus crustaceus, uniformis, verrucosus, verrucis vulgo dispersis, convexis, laevigatis, albidis aut cinera-

scentibus, haud pruinosis, KHO extus intusque lutescentibus deindeque rubescentibus, medulla alba, jodo caerule-scente, hypothallo nigro. Apothecia nigra, nuda, primum plana et tenuiter marginata, saepe demum convexa immarginataque, haud papillata. Sporae 8-nae, demum fuligineae, murales, long. 0.020—0.034, crass. 0.009—0.015 mm, cellulis paucis aut sat paucis.

Distr. Ad rupes et saxa, granitica, silacea, schistosa, gabbroitica crescit, sat frequenter in provinciis australibus et mediis proveniens, locis numerosis etiam in Lapponia collectum. LIn.: Kõngäs ad Mare Glaciale (Vain.), Inari et Kaamas (F. Silén), in reg. pinifera in Tscharminniemi (Vain.), in reg. subalp. montium Hammastunturit (Vain.). LENont.: Hetta, Kilpisjärvi (Norrl. Ber. Torn. Lappm. p. 340). LKem.: Isovaara et Rovaselkä in Kittilä (G. Lång), Pyhätunturi (Vain.). Ceterum sat frequenter etiam in Lapponia sec. Vain. Adj. Lich. Lapp. II p. 136. Lapp. Tulomensis: Kola (N. I. Fellman). LIm.: Ad fl. Kurengi prope Imandram bor. (N. I. Fellman). Kuus.: In reg. subalp. montium Mäntyunturi et Nuorunen et in reg. abietina montis Näränkåvaara (Vain.). KVien. occ.: Koroppi (Vain.).

Thallus verrucis 1—0.15 mm latis, dispersis aut raro subcontiguus, KHO crystalli rubra, acicularia, brevia (long. 0.003—0.002 mm) demum formans. Apothecia demum modice prominentia, lat. 0.4—1.5 mm, late adnata, basi leviter constricta, opaca. Perithecium fusco-fuligineum, KHO parce crystalli rubra formans. Hypothecium fusco-fuligineum, KHO non reagens. Epithecium rubricosum, fusco- aut rarius olivaceo-fuligineum, KHO non reagens. Hymenium 0.120—0.160 mm crassum, jodo caerulescens. Paraphyses ramosae et ramoso-connexae, crebre septatae, apice modice incrassatae, gelatinam haud abundantem percurrentes. Sporae typice 8-nae, saepe abortu pauciores, oblongae aut ovoideo-oblongae, apicibus rotundatis, septis transversis 3 (—1), loculis septo obliquo aut sublongitudinali vulgo divisus, strato gelatinoso decolorato sat tenui praesertim primum indutae. Gonidia cystococcoidea, globosa, simplicia, diam. 0.006—0.011 mm, vacuolis lateralibus, membrana sat tenui, interdum autosporas circ. 6, globosas aut subellipsoideas, 0.003—0.004 mm longas, 0.003 mm latas continentia.

6. *Rh. phaeolepis* Vain. (n. sp.).

Thallus crustaceus, uniformis, areolatus, areolis contiguus dispersisve, planis aut rarius convexis, olivaceo-fuscescentibus, laevigatis, haud pruinosis, nec KHO, nec jodo reagentibus, hypothallo nigro. Apothecia nigra, nuda, plana, tenuiter marginata, haud papillata. Sporae 4:nae aut binae, decoloratae, murali-divisae, long. 0.026—0.042, crass. 0.014—0.018 mm, cellulis numerosissimis.

Distr. Cum *Rh. geographicum* supra rupem graniticam Helsingforsiae a. 1876 a me lectum.

Sporis decoloribus, partim 4:nis et thallo haud pruinoso a *Rh. concreto* et **Rh. phalerospora*, et sporis multicellulosis a *Rh. distincto* differt. Thallus areolis 0.3—0.6 mm latis, margine haud discoloribus. Apothecia lat. 0.3—0.5 mm, late adnata, basi parum constricta, vulgo leviter prominenter, dispersa, disco laevigato, margine leviter aut haud prominente. Perithecium purpureo-fuscescens, KHO subpurpureum, hyphis sat leptodermaticis. Hypothecium rubricosum-fuliginosum, KHO purpureum. Hymenium crass. 0.120 mm, jodo caerulescens, bene gelatinosum, parte superiore partim aeruginosum, epithecio olivaceo aut pulchre aeruginoso, KHO dilutius colorato. Paraphyses parce ramoso-connexae, crebre aut increbre septatae, apice leviter incrassato. Sporae membrana strato gelatinoso crasso aut sat crasso induta. Gonidia cystococcoidea, globosa, simplicia, diam. 0.008—0.018 mm, chromatophoro irregulari, vacuolis lateralibus, interdum autosporas plures, globosas aut ellipsoideas, diam. 0.008 aut 0.008 × 0.005 mm continentia. — Facie externa haec species intermedia est inter *Rh. leptolepidem* (Anzi) et *Rh. distinctum* Th. Fr.

7. *Rh. concretum* (Ach.) Elenk.

Lich. Fl. Ross. III (1904) p. 126. *Lecidea atroalba* β. *concreta* Ach. Vet. Ak. Handl. (1808) p. 233 (sec. Th. Fr.), non est *Catillaria concreta* Koerb. Syst. Lich. Germ. (1855) p. 232. *L. concreta* Vain. Lich. Sib. Merid. (1896) p. 18, Lich. Cauc. (1899) p. 319. *Rh. confervoides* (D.C.) Mass. Ric. (1852) p. 101. *Rh. geminatum* (Flot.) Koerb. Syst. Lich. Germ. (1855) p. 259; Th. Fr. Lich. Scand. II (1874) p. 623. *Lecidea geminata* Flot. in Zwackh Lich. Exs. (1853) n. 199, 200 (ined.); Nyl. Prodr. Lich. Gall. (1857) p. 375 (129), Lich. Scand. (1861) p. 234; Vain. Adj. Lich. Lapp. II (1883) p. 133. *Rh. Montagnei* (Flot.) Koerb. l. c. (1855) p. 258, Parerg. Lich. 3 Lief. (1861) p. 229; Arn. Lich. Tirol XIII (1874) p. 243 (13), Lich. Fränk. Jur. (Fl. 1884) p. 198. *Lecidea Montagnei* Flot. in Hepp Flecht. Eur. II (1857) n. 309, Index (1867) p. 11.

Thallus crustaceus, uniformis, verrucosus aut raro verruculosus areolatusve, cinerascens aut rarius cinereo-fuscescens, subpruinosis aut rarius nudus, verrucis areolisve laevigatis aut superficie minutissime rimuloso-diffracta, medulla alba, jodo non reagente, hypothallo nigro. Apothecia nigra, nuda, plana et tenuiter marginata aut demum convexa et immarginata, haud papillata. Sporae binae aut singulae, diu aeruginosae, demum nigricantes, long. 0.026—0.070, crass. 0.014—0.030, murali-divisae, cellulis numerosissimis.

F. geminata (Flot.) Vain. *L. concreta* f. *geminata* Vain. Lich. Caucas. (1899) p. 319, Exp. Antart. Belge (1903) p. 31. *L. geminata* Flot. l. c.; Nyl. l. c. *Rh. geminatum* Koerb. l. c. *L. confervoides* γ. *atroalba* a. *macrospora* Hepp Syst. Samml. XIV (1852) n. 174 (nomen inept.).

Exs. Fr. Lich. Suec. Exs. XIV (1833) n. 406 A (sec. Arn., etiam in herb. Nyl.). — Lojka Lich. Hung. Exs. (1882) n. 77. — Havaas Lich. Norv. Exs. (1901) n. 9. — Malme Lich. Suec. Exs. (1909) n. 150.

Sporae binae aut p. p. singulae. Thallus p. p. verrucosus.

Distr. Ad rupes et saxa, granitica et rarius syenitica schistosaque, locis apricis passim aut sat rare. Al.: Inter Kastelholm et Sacerdotium in Sund (H. Hollmén et V. Sederholm). Ab.: Korkmäki in Finby (Vain.). N.: Kappelniemi et ad Ratassomerikonlahti Hoglandiae (M. Brenner Bidr. Høgl. Lafv. p. 110), Helsingforsiae et in Mjölö (Vain.). Ka.: Locis numerosis ad Viburgum (Vain. Lich. Vib. p. 67). Sa.: Lauritsala (E. Nylander), Savonlinna (O. Carlenius). KOn.: Suojärvi, Koikari (Norrl. Fl. Kar. Oneg. II p. 35). KVien. occ.: Uhtua (Vain., f. Montagnei in Vain. Adj. Lich. Lapp. II p. 134). Kuus.: Ad Kitkajoki (F. Silén) et Mäntyjoki (Vain.), et in reg. subalp. montis Iivaara (Vain. l. c.). LENont.: Kaaresuanto (Norrl. Ber. Torn. Lappm. p. 340). LTul.: Kildin, „passim usque ad Mare Glaciale“ (N. I. Fellman, sec. Nyl. Lich. Lapp. Or. p. 162). LIm.: Poreguba (G. Selin, sec. Nyl. l. c.).

Thallus verrucis verruculisque convexis et areolis planis, 0.25—0.3 (—0.7) mm latis, contiguis aut dispersis, nec KHO nec CaCl₂O₂ distincte reagens (conf. Arn. et Th. Fr.). Apothecia crebra aut dispersa, late adnata et leviter prominentia aut rarius inter areolas immersa et thallum haud superantia, lat. 0.5—0.7 (0.9) mm, disco laevigato aut leviter scabrido, haud pruinoso (aut pruinoso in f. *irrorata* Th. Fr. Lich. Scand. II p. 624). Perithecium extus purpureo-fuligineum, intus dilutius sordideque coloratum aut subpallidum, cellulis brevibus, sat parvis. Hypothecium purpureo- aut fusco-fuligineum. Epithecium purpureo-fuligineum (aut raro sordide atroviride sec. Arn.), KHO vulgo distinctius violascens sec. Arn. et Th. Fr. Sporae ellipsoideae oblongaeve, long. circ. 0.040—0.070, crass. 0.023—0.030 mm, strato gelatinoso

decolorato primum indutae. Gonidia cystococcoidea, globosa, simplicia, diam. 0.010—0.016 mm, vacuolis lateralibus, chromatophoro anguloso, membrana sat tenui.

F. *Montagnei* (Flot.) Vain. *Rh. Montagnei* Flot. in Koerb. Syst. Lich. Germ. (1855) p. 258. *Lecidea* Flot. in Hepp Flecht. Eur. II (1857) n. 309; Nyl. Lich. Scand. (1861) p. 259. *L. geminata* f. *Montagnei* Nyl. Prodr. Lich. Gall. (1857) p. 375 (129). *L. dispersa* Naeg. in Hepp Flecht. Eur. I (1853) n. 28. *Rh. confervoides* Mass. Ric. Lich. Crost. (1852) p. 101, fig. 205 (*Rh. confervoides* D.C. Fl. Fr. II, 1805, p. 366 sec. Mass. l. c., haud *Buellia confervoides* Kremp. Lich. Bay., 1861, p. 200, nomen incertum). *L. concreta* f. *confervoides* Vain. Lich. Caucas. (1899) p. 319.

Exs. Rabenh. Lich. Eur. Exs. XI (1857) n. 329.

Sporae singulae.

Distr. In insula Mjölö prope Helsingforsiam (Vain.) et abundantissime supra rupes littorales in Suomenlinna (Vain.).

„Sterigmata simplicia“, conidia „recta, long. 0.009—0.010 mm“ (sec. Flagey Lich. Franche-Comté p. 496).

F. *epitoma* Vain. *L. geminata* f. *epitoma* Vain. Adj. Lich. Lapp. II (1883) p. 134.

Sporae minores, long. circ. 0.026—0.043, crass. 0.014—0.017 mm, binae aut p. p. singulae.

Thallus verruculis 0.3—0.5 mm latis, laevigatis, subcontiguis, jodo non reagentibus.

Distr. Ad saxa dioritica in reg. subalpina montis Iivaara in par. Kuusamo (Vain.).

F. *irrigua* (Flot.) Vain. *Rh. geminatum* β . *irriguum* Flot. in Koerb. Syst. Lich. Germ. (1855) p. 259 (fragm. specim. orig. in herb. Nyl. n. 9866), Parerg. Lich. 3 Lief. (1861) p. 230.

Thallus areolatus, areolis contiguis, planis, laevigatis. Sporae binae aut p. p. singulae.

Distr. Supra lapidem graniticum in Tervaniemi Viburgi (Vain.).

Forsan est *L. geminata* β . *irrigua* Flot. in Zwackh Lich. Exs. (1853) n. 199, a nobis non visa et ined.

8. **Rh. phalerospora* Vain.

Lecidea geminata **L. phalerospora* Vain. Adj. Lich. Lapp. II (1883) 134. *L. apopetraea* Nyl. Lich. Nov. Fret. Behr. (Fl. 1885) p. 446, Enum. Lich. Fret. Behr. (1888) p. 15 (sec. herb. Nyl.). *Rh. grande* f. *phalerosporum* Elenkin Lich. Fl. Ross. IV (1904) p. 159, n. 195 (non vidi).

Thallus crustaceus, uniformis, verruculosus verrucosusve aut subareolatus, cinerascens aut fusco-cinerascens, subpruinosis, verruculis sat laevigatis, medulla alba, nec KHO, nec jodo reagente, hypothallo nigro, bene evoluta aut evanescente. Apothecia sat parva, nigra, nuda, plana et tenuiter marginata aut demum convexa immarginataque, haud papillata. Sporae 8:nae—4:nae—2:nae singulaeve (in eodem apothecio), diu aeruginosae, demum fuligineae, murali-divisae, long. 0.030—0.044 (—0.024), crass. 0.013—0.019 (—0.010) mm, cellulis demum numerosissimis numerosisve.

Distr. Ad rupes et saxa, granitica, gneissacea, dioritica et gabbroitica crescit. Kb.: Saramo et Ylikylä in Nurmes (Vain. l. c.). OKaj.: Kymälä in Kianta (Vain.). Kuus.: In reg. abietina montis Näränkäväära (f. extenuata).

Thallus verruculis areolisve 0.5—0.2 (—0.15) mm latis, convexis aut depressis aut raro planis, dispersis aut partim subcontiguis, KHO cum CaCl_2O_2 non reagentibus. Apothecia 0.7—1 (—0.3) mm lata, sat late adnata, basi leviter constricta, prominentia, vulgo sat dispersa, disco laevigato aut leviter scabrido, margine saepe primum leviter prominente. Perithecium extus subpurpureo-fuscofuligineum, intus dilute coloratum. Hypothecium fuscescens, KHO subpurpureum. Hymenium circ. 0.110—0.150 mm crassum, jodo persistenter caerulescens, gelatinosum. Epithecium fusco- aut subrubricosum- aut rarius olivaceo-fuscescenti- vel olivaceo-fuligineum, KHO subpurpureum. Paraphyses parce ramoso-connexae, apice leviter incrassatae. Sporae strato gelatinoso, crasso, decolorato indutae. — Intermedia est inter *Rh. concretum* et *Rh. grande*, a posteriore verruculis thalli tenuiter pruinosis et medulla jodo non reagente differens.

F. extenuata Vain. **L. phalerospora* f. *extenuata* Vain. Adj. Lich. Lapp. II (1883) p. 135.

Thallus areolis 0.15—0.3 mm latis, planis aut depresso-convexis, tenuibus, dispersis, hypothallo tenui, disperso. Epithecium rubricosum, fuscescenti- aut olivaceo-fuligineum. Sporae 8:nae—4:nae (—2:nae), long. 0.024—0.044, crass. 0.012—0.018 mm, diu aeruginosae, cellulis numerosissimis.

Distr. In latere rupis gabbroiticae in reg. abietina montis Näränkäväära in Kuusamo (Vain.).

Rh. umbilicatum (Ram.) Jatta

Fl. It. Crypt. Lich. (1911) p. 689, incl. *Rh. calcareum* Jatta l. c. *Lecidea umbilicata* Ram. Mém. Soc. Linn. Paris 1827 p. 434, sec. specim. a Nyl. determ.; Des Moul. Act. Ac. Sc. Bord. 1844 p. 105; Nyl. in Gasil. Contr. Lich. Plat. Centr. (1898) p. 58. *L. petraea* 2. *umbilicata* Nyl. Prodr. Lich. Gall. (1857) p. 374. *L. calcaria* α. *Weisii* Schaer. Lich. Helv. Exs. VII et VIII (1828) n. 184 p. p. (sec. Arn. Lich. Exs. 215 d), En. Lich. Eur. (1850) p. 121. *Diplotomma Weissii* Mass. Ric. Lich. Crost. (1852) p. 99, Sched. Crit. (1855) p. 32. *D. Weisii* Krempelh. Lich. Bay. (1861) p. 209. *Siebertia Weisii* Arn. Lich. Tirol XX (1879) p. 14. *Rh. calcareum* α. *Weisii* Th. Fr. Lich. Scand. II (1874) p. 631. *Diplotomma calcareum* Krempelh. Fl. 1853 p. 220 (non *Lichen calcarius* L., nec *Weis* sec. Arn. l. c.). Forsan *L. amylaceus* Ach. Vet. Ak. Handl. 1794 p. 191 (conf. Th. Fr. l. c. p. 536). *L. rimosus* Dicks. Fasc. Crypt. Brit. (1785) p. 12 sec. Leight. Lich. Great Brit. 3 ed. (1879) p. 379 (conf. autem Schaer. Lich. Helv. Spic. p. 144), haud Retz. (1779).

Exs. Fr. Lich. Suec. Exs. XIV (1833) n. 412 (in herb. Nyl.). — Hepp Flecht. Eur. I (1853) n. 147 (sec. Stizenb.). — Arn. Lich. Exs. (1869) n. 215 b, (1883) d (a et c non vidi). — Lojka Lich. Regn. Hung. Exs. IV (1884) n. 194.

Thallus crustaceus, crassus aut modice incrassatus, continuus aut rimosus vel areolato-diffractus, uniformis aut saepe demum ambitu subeffiguratus, sat laevigatus, albus, cretaceo-opacus, nec KHO, nec jodo reagens, hypothallo indistincto aut linea obscurata indicato. Apothecia primum margine instructa thallino, vulgo crasso, extus cinerascenti-obscurato subpruinosoque, intus albido, demum toto obscurato tenuioreque, disco plano, nigro, nudo, haud papillato. Epithecium olivaceum. Sporae 8-nae, decoloratae aut demum obscuratae, long. circ. 0.021—0.030, crass. 0.012—0.015 mm, murali-divisae, cellulis haud aut rarius sat numerosis.

Distr. Praesertim ad rupes calcarias etiam in Scandinavia proveniens, in Fennia nondum collectum est.

Facie externa saepe vix satis a *Rh. concentrico* v. *excentrico* differt, apotheciis novellis parathecio obscurato nullo instructis eo dissimile. Crystalla calcii oxalat. nulla in thallo observavi. Apothecia crebra aut saepe irregulariter aggregata, disco circ. 0.5–1.3 mm lato, saepe difformi, margine thallino gonidiis mox emorientibus, saepe KHO lutescente, ex hyphis thallinis, crebre irregulariter contextis, partim subconglutinatissimato, demum toto aeruginoso- aut olivaceo-fuligineo. Hypothecium rubricosum-fuligineum. Hymenium 0.110—0.180 mm crassum, jodo persistenter caerulescens. Paraphyses parce ramoso-connexae, crebre septatae, gelatinam sat abundantem percurrentes. Sporae septis transversis 3—4, loculis septis longitudinalibus 1—2 divisissimis, strato gelatinoso sat crasso indutae.

9. *Rh. concentricum* (Dav.) Vain.

Lichen concentricus Dav. Trans. Linn. Soc. II (1794) p. 284.
Lichen calcarius Weis Pl. Crypt. Gotting. (1770) p. 40 (haud L. Sp. Pl. II, 1753, p. 1140). *Rh. calcareum* Th. Fr. Lich. Scand. II (1874) p. 631.

Thallus crustaceus, uniformis, continuus aut rimosus vel areolato-diffractus, laevigatus aut verrucoso-inaequalis, albus aut cinerascens, nec KHO, nec jodo reagens, hypothallo nigricante aut indistincto. Apothecia thallo immersa, vulgo mediocria, disco plano, nigro, nudo, haud papillato, margine modice incrassato aut sat tenui, subpersistente, nudo aut pruinoso. Epithecium olivaceum aut subfuscescens. Sporae 8:nae, decoloratae aut demum leviter obscuratae, „long. 0.022—0.045, crass. 0.010—0.021 mm“ (sec. Arn. et Th. Fr.), demum murali-divisae, cellulis haud numerosis.

F. subconcentrica (Fr.) Vain. *Lecidea atroalba* ε . *subconcentrica* Fr. Lich. Eur. Ref. (1831) p. 313. *Rh. petraeum* δ . *subconcentricum* Koerb. Syst. Lich. Germ. (1855) p. 260. *Rh. subconcentricum* Koerb. Parerg. Lich. 3 Lief. (1861) p. 232. *Lichen concentricus* Dav. l. c. *Rh. concentricum* Beltr. Cas. Lich. Bassan. (1858) p. 187; Arn. Lich. Fränk. Jur. (Fl. 1884) p. 199 (573), Lich. Münch. (1891) p. 94; Flag. Fl. Lich. Franche-Comté II (1894) p. 499. *L. petraea* **L. concentrica* Nyl. Lich. Scand. (1861) p. 234. *L. excentrica* f. *concentrica* Nyl. Lich. Paris (1896) p. 101. *Rh. petraeum* Mass. Ric. Lich. Crost. (1852) p. 102 (haud *L. petraeus* Wulf. Winterb., 1788, p. 89 sec. Arn. Zur Erinn. Wulf. p. 157).

Exs. Leight. Lich. Brit. Exs. I (1851) n. 17. — Rabenh. Lich. Eur. Exs. IV (1856) n. 109.

Thallus tenuis aut modice incrassatus, uniformis, cinerascens aut sordide albidus, hypothallo indistincto aut leviter evoluto nigricanteque. Apothecia p. p. in seriebus subconcentricis disposita, disco nudo, margine modice incrassato aut sat tenui, nigro nudoque aut cinerascente et tenuiter subpruinoso.

Distr. Ad saxum diabasicum loco calcario ad Simonsby in Pargas in Ab. (K. Linkola).

Thallus variat obscuratus et albidus (sec. Arn.), KHO cum CaCl_2O_2 non reagens, crystallia calcii oxalat. abundanter continens. Apothecia lat. circ. 1—0.5 mm, KHO non reagentia. Perithecium rubricosofulgineum aut (in eodem apothecio) in margine intus subpallidum, hyphis sat leptodermaticis, conglomeratis. Hypothecium rubricosofulgineum.

Hymenium circ. 0.150 mm crassum. Epithecium olivaceum aut (in eodem apothecio) rubricoso-fuligineum. Paraphyses parce ramoso-connexae, gelatinam sat abundantem percurrentes. Sporae „typice decoloratae, long. 0.025—0.030 mm, crass. 0.012—0.015 mm, septis transversis 3—5“ (sec. Flag. et Arn.), demum „valde murales“ (sec. Flag.). „Sterigmata simplicia“, conidia „cylindrica, recta“ (sec. Flag.). Gonidia cystococciodea, simplicia, globosa, diam. 0.008—0.010 mm, aut subellipsoidea et diam. 0.012 \times 0.009 mm, membrana sat tenui.

F. *excentrica* (Ach.) Vain. *Lecidea petraea* β . *excentrica* Ach. Meth. Lich. (1803) p. 37, Lich. Univ. (1810) p. 156. *L. petraea* **L. excentrica* Nyl. Lich. Scand. (1861) p. 234. *Rh. excentricum* Arn. Lich. Fränk. Jur. (Fl. 1884) p. 200 (564), Lich. Münch. (1891) p. 94; Flag. Lich. Franche-Comté II (1894) p. 500. *L. petraea* γ . *L. callistea* Ach. Meth. Lich. Suppl. (1803) p. 9 (ad hanc Malme Lich. Suec. Exs. XIV, 1913, n. 350 pertinet).

Thallus modice incrassatus aut sat tenuis, albus aut albidus (aut cinerascens in *callistea* Ach.), nigro-limitatus aut lineis nigris decussatus aut hypothallo indistincto. Apothecia sparsa aut irregulariter aggregata, disco nudo, margine modice incrassato aut sat tenui, nigricante nudoque aut cinerascente et tenuiter pruinoso.

Sec. Th. Fr. Lich. Scand. II p. 633 in Enontekis in Lapponia Tornoënsi a Norrl. collecta est, sed specimen (ad Kelottijärvi lectum), ad quod verisimiliter spectatur, „*L. petraea* f. *subcontigua*“ a Nyl. determinatum (cum annot. „vix differt ab *excentrica* Ach.“), thallo cinereo, areolato-diffracto, apotheciis p. p. papillatis, margine sat crasso cinctis, instructum, ad *Rh. obscuratum* f. *fuscocineream* (Krempeh.) Arn. pertinet.

Obs. *Lecidea persimilis* Nyl., Ad Veg. Lich. Helsingf. Sav. (Not. Sällsk. F. Fl. Fenn. Förh. IV, 1859) p. 237, Lich. Scand. (1861) p. 236 (*Rh. calcareum* β . *concentricum* f. *persimilis* Blomb. et Forss. En. Pl. Scand., 1880, p. 94), sec. Th. Fr. Lich. Scand. II p. 633 est forma lignicola var. *excentricae*, quod autem incertum mihi videtur, quia *Rh. concentricum* locis normalibus crescens in Fennia rarissimum est. Ceterum haec forma, parcissime lecta, vix certe determinabilis est. A *Rh. obscurato* f. *xylogena* Th. Fr. apotheciis haud distincte papillatis, tenuiter marginatis et hymenio haud aeruginoso differt. Thallus sordide subcinerascens, areolatus, haud pruinosis, hypothallo indistincto. Apothecia lat. 0.4—0.3 mm, disco nigro, nudo, plano aut leviter convexo, margine sat acuto, nigro, nudo. Epithecium olivaceum aut fuscescens in eodem apothecio. Hypothecium et perithecium rubricoso-fuligineum. Paraphyses gelatinam sat abundantem percurrentes. Sporae „decolores aut demum leviter obscuratae, 3-septatae, long. 0.019—0.024, crass. 0.008—0.009 mm, halone circumdatae“ sec. Th. Fr. (in apothecio a me examinato

tantum 1 sporam 2-septatam et plures 1-septatas vidi). Planta analogamelius evoluta lecta est ad Femsjö in Suecia (E Fr.) sec. Th. Fr.

10. *Rh. obscuratum* (Ach.) Mass.

Ric. Lich. Crost. (1852) p. 103, f. 207; Koerb. Syst. Lich. Germ. (1855) p. 261; Th. Fr. Lich. Scand. II (1874) p. 628; Arn. Lich. Münch. (1891) p. 93, Lich. Fragm. 35 (1896) p. 32. *Lecidea petraea* γ. *L. obscurata* Ach. Lich. Univ. (1810) p. 156 p. p.; Nyl. (Lich. Scand., 1861, p. 234) Lich. Paris (1896) p. 101. *L. obscurata* Schaer. Nat. Anz. 1818 p. 9, Lich. Helv. Spic. III (1828) p. 130 (sec. descr.); Vain. Adj. Lich. Lapp. II (1883) p. 137. *L. lavata* Nyl. Fl. 1873 p. 23; Hue Addend. II (1888) p. 218 (*L. atroalba* v. *lavata* Fr., Nov. Sched. Crit., 1827, p. 18, Lich. Suec. Exs. n. 383, ad var. hujus speciei spectat). *L. petraea* f. *concreta* Nyl. Lich. Scand. p. 234, haud Ach. *Rhizocarpon confervoides* D.C. Fl. Fr. 3 éd. II (1805) p. 366 p. p. (conf. p. 300).

Exs. Fr. Lich. Suec. Exs. XIII (1827) n. 383 (f. lav.). — Schaer. Lich. Helv. Exs. VIII (1828) n. 177 (herb. D.C.), 180 p. p. (sec. Th. Fr. et Arn., diversa in herb. D.C.). — Flot. Lich. Exs. (1829) n. 174 (in herb. Nyl.). — Zwackh Lich. Exs. (1852) n. 133, (1879) 546 A, B, 547, 548, (1880) n. 607. — Anzi Lich. Exs. Min. Rar. It. VII (1865) n. 307, 309 (sec. Arn.). — Hepp Flecht. Eur. IV (1867) n. 756 (sec. Arn.). — Arn. Lich. Exs. (1879) n. 815 a, b, (1880) n. 853, (1884) n. 1059 (f. lav.), (1888) n. 1396, Lich. Monac. Exs. (1890) n. 119. — Malme Lich. Suec. Exs. I (1897) n. 16, XXV (1916) n. 623 (f. lav.). — Havaas Lich. Norv. Exs. (1902) 118, 119 (f. lav.).

Thallus crustaceus, uniformis, areolatus, areolis contiguus, planis (aut raro leviter convexus), laevigatis, aut subcontinuus et rimuloso-diffractus, cinereus aut obscure cinerascens aut cinereo-albidus aut (in v. *lavata*) pallidus vel ferrugineo-pallescent, haud pruinosis, jodo non reagens, hypothallo nigricante aut indistincto. Apothecia vulgo mediocria, primum immersa, demum prominentia, disco plano, saepe papillato, nigro aut (in v. *lavata*) ochraceo-pruinoso subfuscescente, margine persistente et crassiusculo aut raro in formis nonnullis sat tenui, vulgo disco concolore. Sporae 8-nae, decoloratae aut raro demum obscuratae, long. 0.022—0.042 mm (—0.050 mm sec. Th. Fr.), crass. 0.009—0.018 mm (—0.021 mm sec. Th. Fr.), murali-divisae, cellulis vulgo demum numerosis.

Distr. Supra saxa et rupes formae diversae in diversis stationibus proveniunt.

F. fuscocinerea (Krempelh.) Arn. (f. *fuscocinereum* Arn.) Lich. Fragn. XII (Fl. 1871) p. 149. *Rh. petraeum* a. *majus* a. *fuscocinereum* Krempelh. Lich. Bay. (1861) p. 203 (em.). *Lecidea petraea* β . *fuscocinerea* Hepp Flecht. Eur. IV (1867) n. 756. *L. obscurata* var. *fuscocinerea* Vain. Adj. Lich. Lapp. II (1883) p. 138. *L. petraea* f. *subcontigua* Nyl. Lich. Lapp. Or. (1866) p. 162 (haud Addit. Lich. Bol., 1862, p. 381). *L. petraea* var. *irrigua* Flot. in Zwackh Lich. Exs. (1852) n. 133 (nomen varietati locis irriguis haud crescenti ineptum). *L. confervoides* β . *concreta* Schaer. Lich. Helv. Spic. III (1828) p. 128, Lich. Helv. Exs. (1828) n. 177 (haud Ach.).

Exs. supra indicata.

Thallus tenuis aut sat tenuis, cinereus aut subcinerascens aut raro subfuscescenti-cinerascens vel cinereo-albidus. Apothecia atra, nuda, margine crassiusculo. Epitecium subolivaceum.

Distr. Ad lapides, praesertim graniticos, in campis graminosis et ericetis passim aut sat frequenter in partibus meridionalibus territorii et adhuc in Ostrobotnia Kajanensi (Vain. Adj. Lich. Lapp. II p. 138). LTul.: Ad Kuolla (N. I. Fellman, „*L. petraea* f. *subcontigua*“ Nyl. Lich. Lapp. Or. p. 162). LEnont.: Kelottijärvi (J. P. Norrlin). LKem.: (E. Nylander). KJer.: Knjasa (Fellm.). Kuus.: Ad Kitkajoki (F. Silén).

Thallus areolis circ. 1—0.2 mm latis, planis aut raro leviter convexus, laevigatis, aut subcontinuus et rimuloso-diffractus, nec KHO, nec CaCl_2O_2 , nec his solutionibus unitis reagens. Apothecia 0.6—0.8 (0.5—1) mm lata, saepe sat crebra aut partim aggregata. Perithecium purpureo-fuligineum aut olivaceo-nigricans, KHO non reagens. Hypothecium rubricosum aut fusco-fuligineum, KHO parum reagens, ex hyphis irregulariter contextis, conglomeratis, leviter pachydermaticis formatum. Epitecium sordide subolivaceum, KHO non reagens. Hymenium ceterum parte superiore saepe aeruginosum decoloratumve, crass. 0.080—0.100 mm. Paraphyses gelatinam abundantem percurrentes, crebre septatae, parce ramoso-connexae, apice leviter aut parum incrassatae. Asci ventricosi-clavati. Sporae strato gelatinoso sat crasso indutae, cellulis saepe haud valde numerosis, seriebus transversis cellularum saepe 5—9. Conidangia „punctiformia, thalli areolis insidentia“. Conidia „recta aut subrecta, long. 0.012—0.015, crass. 0.001 mm“ (sec. Arn. Lich. Tirol XIII p. 243, XX p. 374), et „recta bacillariaeque, long. 0.006, crass. 0.0006 mm“ (sec. Nyl. Lich. Paris p. 101 et annot. in n. 9777 in herb. Nyl.). Gonidia cystococcoidea, simplicia, vacuolis lateralibus, globosa, diam. 0.007—0.013 mm, aut ellipsoidea et long. 0.014—0.016 et crass. 0.008—0.010 mm, membrana sat tenui.

F. lavata (Ach.) Th. Fr. Lich. Scand. II (1874) p. 629. *Rh. obscuratum* b) *lavatum* Arn. Lich. Münch. (1891) p. 93. *Lecidea atroalba* v. *lavata* (Ach.) Fr. Nov. Sched. Crit. (1827) p. 18, Lich. Suec. Exs. XIII (1827) n. 383, Lich. Eur. Ref. (1830) p. 313. *L. obscurata* v. *lavata* Vain. Adj. Lich. Lapp. II (1883) p. 138. *Rh. lavatum* Arn. Lich. Tirol XXIII (1887) p. 90. *Rh. obscuratum* **oxydatum* Koerb. Parerg. Lich. 3 Lief. (1861) p. 233 (haud Fr.). *L. petraea* var. *ferrata* Nyl. Lich. Scand. (1861) p. 234. *Rh. obscuratum* f. *ferrata* A. Smith Mon. Brit. Lich. II (1911) p. 197. *L. ochrotropa* Nyl. Fl. 1875 p. 445. *Rh. obscuratum* f. *lavata*, *ferrana* Britzelm. Lich. Exs. (1905) n. 700.

Exs. Fr. Lich. Suec. Exs. XIII (1827) n. 383 (in Mus. Paris.). — Arn. Lich. Exs. (1884) n. 1059 (in v. fuscocineream transiens). — Havaas Lich. Norv. Exs. (1902) n. 119. — Malme Lich. Suec. Exs. XXV (1916) n. 623.

Thallus tenuis aut modice incrassatus, subcontinuus rimulosusque aut vulgo areolatus, areolis planis aut raro p. p. leviter convexus, ochraceus aut pallidus. Apothecia disco ochraceo-pruinoso aut fuscescente, margine vulgo crassusculo, concolore aut nigro.

Distr. Ad rupes et saxa granitica littoralia et in rivulis. Sat.: Siikainen (A. J. Malmgren). Ta.: Teurois in Tammela (A. Kullhem). Tb.: Norola in par. Jyväskylä (*L. ochrotropa* Nyl. in Vain. Fl. Tav. Or. p. 117). OKaj.: Suomula et Saarijärvi in Kianta (Vain.).

Thallus subcontinuus rimulosusque aut areolatus, laevigatus. Apothecia crebra aut irregulariter aggregata, lat. circ. 1.2—0.5 mm, primum saepe thallum haud superantia, demum vulgo prominentia adnatae. Perithecium intus fusco-fuligineum. Hypothecium fusco-aut rubricosum-fuligineum, KHO distinctius rubricosum. Epithecium fulvo-fuscescens aut fusco-rubricosum aut olivaceum et hymenium superius dilute aeruginosum aut olivaceum fuscescensve (etiam in eodem apothecio varians), epithecio KHO saepe distinctius rubricosum. Hymenium —_{0.120} mm crassum. Sporae 8-nae aut abortu pauciores, decoloratae aut rarius demum sordide glaucescentes, long. circ. 0.020—0.034, crass. 0.012—0.018 mm, submurales cellulisque paucis aut demum murali-divisae et cellulis numerosis. Conidia recta, long. 0.015, crass. 0.001 mm (sec. Arn. Lich. Tirol XIII p. 249). Gonidia cystococcoidea, globosa, diam. 0.007—0.012 mm, aut subellipsoidea et diam. 17×10, 14×12 μ , simplicia, chromatophoro centrali, anguloso irregularique, vacuolis laterilibus, membrana sat tenui.

F. amphibola Vain. *Lecidea amphibia* Nyl. in Norrl. Fl. Kar. Oneg. II (1876) p. 35; *L. obscurata* var. *amphibia* Vain. Adj. Lich. Lapp. II (1883) p. 139 p. maj. p.

Thallus sat crassus, areolatus, areolis depresso-convexis aut planis, contiguus, cinereis. Apothecia nigra, nuda, margine modice incrassato. Hymenium praesertim parte superiore partim aeruginosum, epithecio vulgo subolivaceo.

Distr. Supra rupes et saxa, gneissacea et granitica, in campis graminosis et aliis locis apertis et in littoribus rivulorum lacuumque, raro in latere rupis loco umbroso. N.: Punavuoret Helsingforsiae (a. 1874 legi, „*L. amphibia*“ sec. determ. Nyl.). Ta.: Onkisalo in Lühanka („*L. amphibia* forma atypica“ in Vain. Fl. Tav. Or. p. 117). Tb.: Norola in par. Jyväskylä (Vain., 9872 in herb. Nyl.). Kb.: Niska in Enontaipale (Vain.). KOn.: Pyhäniemi („*L. amphibia*“ sec. determ. Nyl. in Norrl. Fl. Kar. Oneg. II p. 35). OKaj.: Tervasalmi in Kuhmo, Pietari et Kiannanniemi in Kianta („v. *amphibia*“ in Vain. Adj. Lich. Lapp. II p. 139).

Rh. amphibium (Fr.) in memoriam revocans et cum eo commixta, apotheciis demum prominentibus adnatisque, nec aspicilioides nec immersis, et thallo distinctius areolato, nec subcontinuo ab eo differens. Thallus areolis laevigatis, KHO non reagens. Apothecia sat crebra aut partim sublineato- vel irregulariter aggregata, lat. 0.5—1.3 mm, demum prominentia adnata, disco vulgo papillato. Perithecium rubricosum- aut in margine cyanescenti-fuligineum. Hypothecium fuscescens aut fulvo-fuscescens aut rubricosum. Hymenium circ. 0.140—0.150 mm crassum. Sporae decoloratae aut demum aeruginosae, long. circ. 0.024—0.034 mm (—0.040 mm sec. annot. Nyl.), crass. 0.010—0.016 mm, demum vulgo murali-divisae aut submurales.

F. xylogena Th. Fr. Lich. Scand. II (1874) p. 629.

Thallus modice incrassatus, verrucosus, verrucis circ. 0.25 (0.2—0.3) mm latis, convexis aut depresso-convexis, contiguus aut confluentibus, subolivaceo- aut subfusciscenti-cinereis. Apothecia nigra, margine modice incrassato.

Distr. Ad conductum ligneum molendinae in Kurkoja in Korpi-lahti in Ta. (Vain. Fl. Tav. Or. p. 117).

Perithecium et hypothecium rubricosum-fuligineum. Hymenium dilute aeruginosum, epithecio subviolascens. Sporae 8-nae, decoloratae, long. 0.026—0.031, crass. 0.013—0.016 mm, septis transv. 3—5, loculis 2— pluribus septo uno aut septis duobus longitudinalibus obliquisve divisus.

Obs. 1. *Rh. confervoides* D.C. sec. Nyl. in Hue Addend. II (1888) p. 218 pertinet ad *L. lavatam* Nyl. (*Rh. obscuratum* Mass.). Sec. Nyl. Lich. Scand. p. 233 et Lamy Cat. Lich. Mont-Dore (1880) p. 132 spectat ad statum hypothallo fimbriato-radiante instructum. Ex herb. D.C. „compositum est e veri *Rhizocarpi* (h. e. *Eurhizocarpi*) et *Lecideae* speciebus“, ut indicat Th. Fr. in Lich. Scand. II p. 618.

Obs. 2. *Lecidea petraea* var. *subcontigua* Nyl., Addit. Lich. Boliv. (1862) p. 381, sec. specim. orig. n. 9857 est species autonoma, ut jam Nyl. observavit sec. annot. suas, thallo laevigato, rimoso-areolato, areolis planis, albis, KHO demum rubescentibus instructa, et nominetur *Rh. subcontigua* (Nyl.). Proximum est *Rh. plicatili* (Leight.).

11. **Rh. orphninum* Vain.

Lecidea obscurata var. *fuscocinerea* f. *orphnina* Vain. Adj. Lich. Lapp. II (1883) p. 138. **Rh. roridulum* Th. Fr. Lich. Scand. II (1874) p. 629 p. p. (sec. descr.). *L. roridula* Nyl. Enum. Lich. Fret. Behr. (1888) p. 39 (sec. herb. Nyl.).

Thallus crustaceus, uniformis, areolatus aut verrucosus, persicino-cinerascens cinerascensve aut raro cervino-fuscescens, haud pruinosis, nec KHO, nec jodo reagens, hypothallo nigricante aut indistincto. Apothecia sat parva aut rarius fere mediocria, inter verrucas thalli sita aut adnata, vulgo demum prominentia, disco vulgo plano, saepe papillato, nigro nudoque aut raro cinereo-pruinoso, margine sat tenui aut raro fere modice incrassato, nigro, vulgo prominente, persistente. Epithecium rubricosum aut subfuscescens. Sporae 8-nae, decoloratae aut rarius demum aeruginosae, long. 0.022—0.034, crass. 0.009—0.016 mm (sec. Th. Fr.), murali-divisae, cellulis sat numerosis.

F. *derorata* Vain.

Thallus sat tenuis aut sat crassus, areolis verrucisque contiguus aut raro partim dispersis. Apothecia sat parva aut rarius fere mediocria, disco haud pruinoso.

Distr. Supra saxa granitica, syenitica et schistosa. — N.: Tölö Helsingforsiae (Vain.). KLad.: Kirjavalhti („*L. roridula*“ sec. determ. Nyl. in Norrl. Symb. Fl. Lad.-Kar. p. 31). Ta.: Korpilahti (Vain., „*L. roridula*“ in herb. Nyl., n. 9882). Kb.: Supra saxa in rivulo ad Pyssyvaara in Nurmes (Vain.). OKaj.: Supra saxa in rivulo ad Saukko („*L. obscurata* f. *orphnina*“ Vain. l. c.) et Saarikoski („v. *amphibia*“ Vain. l. c. p. 139) in Kianta. Kuus.: Loco haud indicato (veris. Kitkajoki, F. Silén, „*L. roridula*“ in herb. Nyl., n. 9879).

Commixta cum *Rh. roridulo*, a quo thallo haud distincte pruinoso et apotheciis demum magis prominentibus, disco saepe papillato, haud pruinosis differt, sed in *Rh. obscuratum* transire videtur, vix nisi colore hymenii epitheciique ab eo recedens. — Thallus modice incrassatus, CaCl_2O_2 non reagens, verrucis areolisque vulgo 0.6—0.3 mm latis, con-

tiguis. Apothecia sat crebra, lat. 0.8—0.4 mm. Perithecium fuscescens aut rubricosum-fuliginum. Hypothecium fuscescens et superne rubricosum, KHO vulgo pulchrius rubricosum. Epithecium intense rubricosum aut subfuscens (KHO pulchrius subviolaceo-rubricosum), interdum in eodem apothecio partim dilute aeruginosum. Hymenium circ. 0.100—0.110 mm crassum, haud aeruginosum. Sporae seriebus cellularum vulgo 8, strato gelatinoso modice incrassato. Gonidia cystococcoidea, globosa aut subglobosa, diam. 0.007—0.012 mm, interdum autosporas plures continetia, subellipsoideas, long. circ. 0.007, lat. 0.005—0.006 mm.

F. ecrustacea (Nyl.) Th. Fr. Lich. Scand. II (1874) p. 629. *L. petraea* f. *ecrustacea* Nyl. Lich. Lapp. Or. (1866) p. 162.

Thallus tenuissimus, laevigatus, cinerascens, subdispersus. Apothecia lat. 0.4—0.3 mm, nigra, haud pruinosa, margine tenui. Epithecium sordide violascens (aut partim olivaceum in eodem apothecio).

Distr. Supra lapidem graniticum ad Susijärvi in KKER. (N. I. Fellman).

Thallus areolis planis, hypothallo sat distincto. Apothecia saepe papillata, prominentia. Hymenium haud aeruginosum. Hypothecium rubricosum-fuliginum. Sporae 8-nae, decoloratae, submurales, septis transversis 5—4, septis longitudinalibus paucis, long. circ. 0.025—0.027, crass. 0.011 mm.

F. sublavata Vain. *L. obscurata* var. *roridula* f. *sublavata* Vain. Adj. Lich. Lapp. II (1883) p. 139.

Thallus dispersus, hypothallo nigricante, tenui. Apothecia disco saepe pruinoso.

Distr. In rupe talcaceo-schistosa prope Sirkelä in Kuusamo (Vain.).

Thallus verrucis 0.4—0.2 mm latis, depresso-convexis, persicino-cinerascentibus. Apothecia lat. 0.6—0.3 (—1.2) mm, sat crebra, inter areolas disposita, disco plano, saepe cinereo-pruinoso, saepe papillato, margine sat tenui, nigro, nudo, prominente. Perithecium rubricosum-fuliginum. Hypothecium fuscens aut fulvo-fuscens. Epithecium subviolaceo-rubricosum. Sporae decoloratae aut raro demum aeruginosae, cellulis sat numerosis. — Haec forma haud bene cum *Rh. obscurato* jungitur.

12. *Rh. porphyrostrotum* Vain.

Lecidea porphyrostrota Vain. Adj. Lich. Lapp. II (1883) p. 135, 139 (excl. var.).

Thallus crustaceus, uniformis, verruculosus, verruculis minutissimis, convexis aut subglobosis, fuscescentibus aut cinereo-fuscescentibus aut persicino-albidis albidisve, dispersis, haud pruinosis, jodo non reagentibus, hypothallo nigricante vel indistincto. Apothecia mediocria aut sat parva, inter verrucas thalli sita, bene prominentia, nigra, nuda, primum plana tenuiterque marginata, dein convexa immarginataque. Epithecium rubricosum aut subviolaceo-fuligineum. Sporae 8-nae, decoloratae, long. $0.017-0.028$ mm (-0.036 mm sec. annot. Nyl.), crass. $0.009-0.012$ mm (-0.017 mm sec. Nyl.), murali-divisae, cellulis vulgo demum numerosis.

Distr. Ad scopulos et saxa, granitica et gneissacea, et in latere rupis collectum. Tb.: Piililä in Korpilahti („L. roridula“ sec. determ. Nylandri in Vain. Fl. Tav. Or. p. 117). OKaj.: Lehtovaara in Kianta (Vain.). Kuus.: In reg. subalp. montis Mäntytunturi (Vain.). LIn.: Veskonieni (Vain.).

Thallus verruculis $0.2-0.1$ mm latis, KHO non reagentibus, raro p. p. depresso-convexis. Apothecia lat. $0.7-0.8$ (-1) mm, dispersa, late adnata, interdum basi modice constricta, haud papillata. Perithecium rubricosum-fuligineum. Hypothecium rubricosum-fuligineum. Partes obscuratae apotheciorum KHO distinctius et pulchrius subviolaceo-rubricosae. Hymenium circ. $0.080-0.090$ mm crassum. Sporae septis transversis saepe 4, cellulis saepe diu paucis, strato gelatinoso sat tenui. Gonidia cystococcoidea, globosa et diam. $8-18 \mu$, aut ellipsoidea et diam. 15×8 , 14×10 , $20 \times 12 \mu$, simplicia, vacuolis lateralibus, membrana modice aut rarius magis incrassata. — Verruculis minutissimis, dispersis haec species etiam sterilis facile recognita.

13. *Rh. lapillorum* Vain.

Lecidea porphyrostroma f. *lapillorum* Vain. Adj. Lich. Lapp. II (1883) p. 140.

Thallus crustaceus, uniformis, verruculosus, verruculis minutissimis granuliformibusque, convexis, obscure cinereis cinerascentibusve, dispersis, haud pruinosis, jodo non reagentibus, hypothallo indistincto. Apothecia minuta, inter

verruculas thalli sita, nigra, nuda, plana, haud papillata, margine tenui, persistente. Epithecium rubricosum-fuliginum. Sporae 8-nae, decoloratae, long. 0.026—0.030, crass. 0.011—0.014 mm, murali-divisae, cellulis demum sat numerosis.

Distr. Ad lapillos graniticos in ericeto aprico arenoso prope Hossa in Kianta in OKaj. (Vain.).

Verruculis thalli minoribus et apotheciis planis minoribusque a *Rh. porphyrostroto* differt. Thallus verruculis 0.060—0.100 mm latis, KHO non reagentibus. Apothecia sat crebra, lat. 0.4—0.2 mm, late adnata, haud distincte constricta, haud papillata, margine haud prominente. Perithecium et epithecium rubricosum-fuliginum. Hypothecium fusconigrum. Hymenium jodo persistenter caerulescens. Sporae strato gelatinoso sat crasso. Gonidia cystococcoidea, globosa diam. 9—6 μ , parcius subellipsoidea et diam. 8×6 aut $15 \times 10 \mu$, simplicia, vacuolis lateralibus, membrana sat tenui.

14. *Rh. anaperum* Vain.

Lecidea anapera Vain. Adj. Lich. Lapp. II (1883) p. 141.

Thallus crustaceus, uniformis, verruculosus, verruculis minutissimis, depresso-convexis, obscure olivaceis subnigricantibusve, dispersis, haud pruinosis, jodo non reagentibus, hypothallo vulgo indistincto. Apothecia minutissima, nigra, nuda, disco plano, haud papillato, margine tenui, persistente. Epithecium vulgo obscure viridi-olivaceum. Sporae 8-nae, decoloratae, long. 0.020—0.034, crass. 0.010—0.016 mm, murali-divisae, cellulis demum sat numerosis.

Distr. Ad lapillos graniticos in reg. subalpina montis Iivaara in par. Kuusamo (Vain.).

Rh. lapillorum huic est proximum, sed epithecio rubricosum, apotheciis paulo majoribus et margine haud prominente ab *Rh. anapero* differt. — Verrucae thalli diam. vulgo circ. 0.060 mm, raro paulo majores, KHO non reagentes. Hypothallus interdum striis nigris indicatus. Apothecia crebra, lat. 0.2—0.3 (—0.35) mm, late adnata, basi leviter constricta, disco laevigato, margine prominente. Perithecium et hypothecium rubricosum-fuliginum. Hymenium jodo persistenter caerulescens. Epithecium raro partim fuscescens. Paraphyses cellulis oblongis, gelatinam abundantem percurrentes. Sporae septis transversis saepe 5—6, septis longitudinalibus 1—3, strato gelatinoso tenui aut parum evoluto. Gonidia cystococcoidea,

globosa aut subglobosa, simplicia, diam. 0.007—0.016 mm, vacuolis lateralibus, membrana sat tenui.

Rh. roridulum Th. Fr.

Rh. obscuratum **Rh. roridulum* Th. Fr. Lich. Scand. (1874) p. 629 p. p.

Thallus crustaceus, uniformis, areolatus, areolis angulatis, vulgo contiguus, laevigatis, livido- aut subpersicinocinerascentibus, pruinosis, nec KHO, nec jodo reagentibus, hypothallo indistincto. Apothecia fere mediocria aut sat parva, vulgo thallum haud superantia aut raro demum leviter prominentia, disco plano aut raro demum depresso-convexo, pruinoso (aut denudato?), haud papillato, margine sat tenui aut demum attenuato, persistente, nigro nudoque aut pruinoso. Epithecium rubricosum. „Sporae 8-nae, decoloratae, interdum demum leviter olivaceae, long. 0.020—0.040, crass. 0.012—0.022 mm“ (sec. Th. Fr.).

Distr. „Ad rupes regionum alpinarum borealiumque in Suecia et Norvegia“, etiam „ad Nyborg et Mortensnaes in Finmarkia orientali“ (sec. Th. Fr.). Speciminibus certe determinabilibus in Fennia nondum collectum.

Haec species a Th. Fr. non sit rite limitata, quare eam sec. specimen typicum, in ins. Tromsø a Norm. collectum, hic descripsimus. — Thallus modice incrassatus („interdum fere obsoletus“ sec. Th. Fr.), areolis circ. 0.4—1.5 mm latis, KHO cum CaCl_2O_2 non reagentibus. Apothecia lat. saepe 0.8—0.9 (0.5—1) mm („pruina nunc densa, nunc tenuis, nunc nulla“ sec. Th. Fr.), stratis coloratis KHO rubricosio-violascentibus. Perithecium rubricosio-fuligineum aut intus partim dilutius coloratum. Hypothecium fuscum aut rubricosio-fuligineum. Hymenium circ. 0.160—0.180 mm crassum. Epithecium rubricosum aut rubricosio-fuligineum. Paraphyses gelatinam modice abundantem percurrentes, cellulis suboblongis ellipsoideisve, crass. 0.002—0.0025 mm, apice parum incrassatae. Sporae submurales, septis transversis circ. 4—7, cellulis haud numerosis, demum morbose nigricantes. Gonidia cystococcoidea, simplicia, globosa aut subglobosa aut parcius etiam ellipsoidea.

Rh. amphibium (Fr.) Th. Fr.

Lich. Scand. Exs. II (1860) n. 45, Lich. Scand. II (1874) p. 630; Koerb. Parerg. Lich. 3 Lief. (1861) p. 232; Arn. Lich. Fragm. XII (Fl. 1871) p. 149. *Lecidea amphibia* Fr. Vet. Ak. Handl. 1822 p. 262, Lich. Suec. Exs. XIII (1827) n. 381, Nov. Sched. Crit. (1827) p. 16, Lich. Eur. Ref. (1831) p. 307. „*L. petraea* var. (*L. amphibia* Fr.)“ Nyl. Lich. Scand. (1861) p. 234.

Exs. Fr. Lich. Suec. Exs. XIII (1827) n. 381 (in mus. Paris. et herb. Nyl.). — Th. Fr. Lich. Scand. Exs. II (1860) n. 45 (sec. Th. Fr.). — Havaas Lich. Norv. Occ. Exs. II (1913) n. 46 (in herb. meo), Lich. Norv. Exs. (1914) n. 467 (mus. Fenn.).

Thallus crustaceus, uniformis, subcontinuus rimosusque aut demum areolato-diffractus, areolis difformibus, vulgo verruculoso-inaequalibus, saepe margine subrenulatis, caesio-cinerascens, haud pruinosis, jodo non reagens, hypothallo nigricante saepe limitatus. Apothecia vulgo mediocria, thallo immersa et habitu aspicilioidea, aut raro demum leviter subprominentia, disco plano aut raro demum depresso-convexo, haud papillato, nigro, nudo, margine subzeorina aut indistincto aut rarius partim demum lecideino, cinereo-nigricante nigricanteve, tenui. Sporae 8-nae, decolores, long. 0.026—0.036, crass. 0.010—0.016 mm, submurale-divisae, cellulis paucis.

Distr. Ad saxa granitica et gneissacea saepe inundata riparum lacustrum et rivorum in Suecia et Norvegia provenit, sed in Fennia nondum collectum. Specimina Fennica huc relata ad *Rh. obscuratum* f. *amphibolam* pertinent. Videas p. 299.

Habitu aspicilioideo a *Rh. obscurato* distinguitur et autonoma sit species, jam a Fr. recognita et bene descripta. Thallus modice in-crassatus aut sat crassus, nec KHO, nec addito CaCl_2O_2 reagens. Apothecia lat. 1—0.7 (—1.2) mm, sat crebra aut in lineas aggregata. Parathecium rubricosum-fuligineum, tenue aut demum etiam crassum, vulgo thallo immersum et saepe extus haud aut parum visibile. Hypothecium rubricosum- aut fusco-fuligineum. Epithecium rubricosum aut (in Fr. L. S. E. n. 381) olivaceum, sec. Th. Fr. etiam smaragdulum. „KHO apices paraphysum, si in violaceum vergunt, violaceo-rubescunt; aliter colorati non mutantur“ (Th. Fr.). Hymenium circ. 0.150 mm crassum. Sporae septis transversis 4—5, loculis 1—4 septo uno longitudinali divis. Conidia „acicularia, recta (vel leviter curvula), long. 0.006—0.009 mm“ (Th. Fr.).

Obs. *Rh. amphibium* Koerb., Syst. Lich. Germ. (1855) p. 264, sec. exs. cit. et Stizenb. Lich. Helv. p. 201 ad *Rh. leptolepidem* Anzi spectat.

15. *Rh. Oederi* (Web.) Koerb.

Parerg. Lich. 3 Lief. (1861) p. 232; Arn. Lich. Fragm. XII (Fl. 1871) p. 149. *Rh. distinctum* **Rh. Oederi* Th. Fr. Lich. Scand. II (1874) p. 626. *Lichen Oederi* Web. Spic. Fl. Goett. (1878) p. 182 (*L. leprosus ruber* Oed. Fl. Dan. VIII p. 8, tab. 470 f. 1). *Lecidea* Ach. Meth. Lich. (1803) p. 49; Nyl. in Norrl. Bidr. Syöstr. Tav. Fl. (1870) p. 191. *L. petraea* **L. Oederii* Nyl. Lich. Scand. (1861) p. 234. *Rh. petraeum* β . *Oederi* Koerb. Syst. Lich. Germ. (1855) p. 260; Th. Fr. Lich. Arct. (1860) p. 235. *L. atroalba* v. *oxydata* Fr. Nov. Sched. Crit. (1827) p. 18, Lich. Suec. Exs. XIII (1827) n. 384 (in mus. Paris. et herb. Nyl.).

Exs. Fr. l. c. — Hepp Flecht. Eur. III (1860) n. 508 (sec. Arn. Lich. Tirol XXV, 1893, p. 403). — Rabenh. Lich. Eur. Exs. 26 (1864) n. 724. — Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 373. — Arn. Lich. Exs. (1895) n. 1662. — Malme Lich. Suec. Exs. VII (1910) n. 174. — Havaas Lich. Norv. Exs. (1913) n. 446, Lich. Norv. Occ. II (1913) n. 45.

Thallus crustaceus, uniformis, areolatus, areolis contiguous, vulgo minutis, planis aut rarius p. p. convexis et verruculaeformibus, laevigatis, ochraceo-ferrugineis, KHO non reagentibus, medulla jodo violascente aut vix distincte reagente, hypothallo nigro aut evanescente. Epithecium subcaeruleo-nigricans. Apothecia minuta, nigra, nuda, vulgo plana, tenuiter marginata, disco saepe papillato inaequalive. Sporae 8-nae aut 4-nae, decoloratae aut raro demum obscuratae (sec. Th. Fr.), 4-septatae aut raro demum submurales (sec. Nyl.), long. 0.015--0.021 mm (—0.023 mm sec. annot. Nyl.), crass. 0.007—0.009 mm (0.006—0.010 mm sec. Th. Fr.).

Distr. Supra rupes et saxa ferrum continentia, praesertim gneissacea, aut granitica schistosave, locis siccis apricisque (nec „locis saepius inundatis“, ut indicat Th. Fr.). Ab.: Runsala prope Aboam (A. Kullhem). N.: Abrahamsby in Kyrkslätt (Vain.). Ta.: Locis numerosis in Tammela (A. Kullhem), Rauvala (F. Silén) et Kaila (J. P. Norrlin) in Asikkala, Kirkonkylä, Jokioinen, Arakoski in Padasjoki (Vain.), Ronni in Lammi (C. Leopold), Kesäin et Tientaali in Luhanka, Päiväkunta in Korpilahti, et alibi (passim sec. Vain. in Fl. Tav. Or. p. 117). Sa.: Savonlinna (O. Carlenius). Oa.: Lolu (A. J. Malmgren). Sb.: Pitkälähti in Kuopio

(K. Linkola). Kb.: Riihivaara in Nurmes (Vain. Adj. Lich. Lapp. II p. 137).

Thallus sat tenuis aut sat crassus, areolis 0.2—0.7 mm latis. Apothecia crebra, lat. 0.3—0.6 mm, thallum haud superantia aut leviter prominentia, late adnata, basi haud constricta, saepissime morbosa nec bene evoluta. Perithecium rubricosco-fuscescens, KHO violascens. Epithecium sordide caeruleo-nigricans, KHO non reagens. Hypothecium rubricosco-fuligineum, KHO pulchre violascens. Paraphyses parcius gelatinosae, apice leviter incrassatae. Sporae raro bene evolutae, tantum 4-blastae a lichenologis descriptae, etiam loculo uno mediano, septo longitudinali diviso, in n. 10182 in herb. Nyl. delineatae sunt.

Obs. In lichenibus vulgo zona gonidialis jodo non reagens, quare in hac specie, thallo fere omnino gonidiis impleto instructa, reactio jodetica thalli saepe non est distincta.

16. *Rh. plicatile* (Leight.) A. Smith

Mon. Brit. Lich. II (1911) p. 197. *Lecidea plicatilis* Leight. Ann. Mag. Nat. Hist. IV ser. 4 (1869) p. 201, Lich. Great Brit. 3 ed. (1879) p. 380; Nyl. in Zwackh Lich. Exs. (1878) n. 502, Lich. Heidelb. (1883) p. 57. *L. atroalba* A Fr. Nov. Sched. Lich. Suec. (1827) p. 17, Lich. Suec. Exs. XIII (1827) n. 382. *Rh. rubescens* Th. Fr. Lich. Scand. II (1874) p. 631. *Lecidea rubescens* Vain. Adj. Lich. Lapp. II (1883) p. 140. *Rh. coniopsoides* (Hepp) Arn. Lich. Fränk. Jur. (Fl. 1884) p. 199 (593), Lich. Tirol XXIII (1887) p. 87, Lich. Münch. (1891) p. 94. *L. coniopsoides* Hue Lich. Vire (1895) p. 31. *Lecidea Beckhausii* Hepp in Beckh. Zur Krypt.-Fl. Westph. (Verh. Nat. Ver. Rheinl. 1859) p. 440 (conf. Lahm Zus. Westf. Flecht., 1885, p. 104, Koerb. Parerg. Lich. p. 231), nom. nud.

Exs. Fr. Lich. Suec. Exs. XIII (1827) n. 382 A (sec. Th. Fr.), XIV (1833) n. 406 B (in nonn. coll. sec. Arn.). — Zwackh Lich. Exs. (1878) n. 502, (1880) n. 609, (1892) bis. — Arn. Lich. Exs. (1879) n. 814, (1880) n. 854, (1885) n. 1123, Lich. Monac. (1890) n. 120, 121, (1899) n. 497 (sec. Lynge Ind. Exs.). — Lojka Lich. Univ. IV (1886) n. 182. — Malme Lich. Suec. Exs. I (1897) n. 17.

Thallus crustaceus, uniformis, verrucosus aut areolatus, areolis verrucoso-inaequalibus aut verrucis convexis laevigatisque, albus aut cinerascens, haud pruinosis, KHO rubescens, jodo non reagens, hypothallo nigricante. Apothecia vulgo mediocria, inter verrucas thalli sita, nigra, nuda aut raro pruinosa, plana aut demum convexa, margine tenui,

persistente aut demum excluso. Epithecium rubricosum aut fuscescens (aut interdum olivaceum sec. Arn.). Sporae 8:nae, decoloratae, „long. 0.021—0.034, crass. 0.011—0.016 mm“ (sec. Th. Fr.), submurale-divisae, cellulis haud numerosis.

Var. *Beckhausii* (Hepp) Vain.

Exs. supra indicata.

Apothecia haud pruinosa.

Distr. Ad rupes et saxa, gneissacea et schistosa, locis apricis collecta. Sat.: Pengonpohja in Ylöjärvi (A. A. Sola). Ta.: Talsoila in Tammela (A. Kullhem).

Thallus verrucis vulgo 0.3—0.2 (—0.5) mm latis, vulgo contiguus, KHO lutescens, dein rubescens et praecipitatum granulosum rubrum (haud crystallae aciculariae) formans. Apothecia vulgo p. p. irregulariter aggregata contiguaque et tunc saepe angulosa, late adnata, saepe demum leviter constricta, thallum haud superantia aut demum prominentia, lat. 0.7—1.3 mm, haud papillata, primum margine leviter prominente. Perithecium et hypothecium rubricosum-fuligineum, KHO pulchrius rubricosum. Epithecium sordide rubricosum, KHO haud reagens, saepe dilutius coloratum. Hymenium circ. 0.110—0.100 mm crassum, bene gelatinosum. Paraphyses parce ramoso-connexae, cellulis oblongis, apice leviter incrassatae. Sporae strato gelatinoso sat crasso, septis transversis vulgo 5—6, loculis nonnullis septo uno longitudinali oblique divis. Gonidia cystococcoidea, globosa, diam. 0.010—0.012 mm, simplicia, membrana sat tenui.

Var. *cinereolivens* Vain.

Apothecia disco sat tenuiter livido-pruinosa. Thallus verrucis contiguus.

Distr. Supra lapidem gneissaceum ad Herala in Hollola in Ta. (a. 1874 legi).

Thallus albidus, KHO lutescens et demum rubescens. Apothecia demum prominentia convexaque. Perithecium et hypothecium rubricosum-fuligineum. Hymenium circ. 0.090 mm crassum, totum dilute subfuscescens aut epithecio solo subfuscescente subrubricosove aut dilute colorato. Sporae 8:nae, decoloratae, long. 0.025—0.031, crass. 0.009—0.012 mm, septis transversis saepe circ. 5 (4—7), loculis nonnullis septo uno longitudinali oblique divis. — Variatione *dispersa* cum v. *Beckhausii* conjungitur.

Var. *dispersa* Vain. *Lecidea rubescens* f. *dispersa* Vain. Adj. Lich. Lapp. II (1883) p. 140.

Thallus areolis albis, supra hypothallum nigrum dispersis. Apothecia disco tenuissime pruinosa aut p. p. denudata.

Distr. Loco subumbroso in latere rupis graniticae ad Kalliovaara in par. Lieksa in Kb. (Vain.).

Thallus areolis depresso-convexis, saepe nonnullis confluentibus, KHO lutescentibus, dein rubescentibus, jodo non reagentibus. Epithecium olivaceo-nigricans vel aeruginoso-subfuscescenti-fuligineum. Sporae decoloratae.

17. *Rh. distinctum* Th. Fr.

in Falk Östr. Blek. Laffl. (1874) p. 16, Lich. Scand. II (1874) p. 625; Arn. Lich. Münch. (1891) p. 94, Lich. Fragm. 35 (Oesterr. Bot. Zeitschr. 1896) p. 33. *Lecidea distincta* Stizenb. Lich. Hyperb. (1876) p. 47; Nyl. Lich. Paris (1896) p. 102; Vain. Lich. Caucas. (1899) p. 319. *L. petraea* var. *fuscoatra* Flot. Bot. Zeit. 1828 p. 690 (*L. atroalba* v. *fuscoatra* Flot. Lich. Schles., 1829, p. 8, Lich. Exs., 1829, n. 172 A, sec. n. 9865 in herb. Nyl.; *L. atroalba* „saepe *L. fuscoatra* dicta“ Fr. Nov. Sched. Crit., 1827, p. 17 n. 382 B p. p., sec. Arn. Lich. Fränk. Jur., 1884, p. 200). *L. atroalba* v. *fuscoatra* b. *dendritica* Flot. Lich. Schles. (1829) p. 8, Lich. Exs. (1829) n. 172 B (sec. Arn. l. c.). *L. confervoides* η . *dendritica* Schaer. En. Lich. Eur. (1850) p. 113 (citantur Flot. Lich. Exs. n. 172 B, *Verr. dendritica* Hoffm. incogn.). *L. confervoides* β . *areolata* Schaer. En. Lich. Eur. (1850) p. 113 (sec. Hepp Flecht. Eur. n. 36, sed react. nondum cogn.). *L. atroalba* α . *ambigua* Naeg. in Hepp Flecht. Eur. I (1853) n. 36 (conf. p. 311). *Rh. atroalbum* Arn. Lich. Fragm. XII (Fl. 1871) p. 148.

Exs. Fr. Lich. Suec. Exs. XIII n. 382 B p. p. (sec. Arn. l. c., Th. Fr. l. c. p. 614). — Schaer. Lich. Helv. Exs. VIII (1828) n. 178 p. p. (sec. Arn. l. c., Th. Fr. l. c. p. 626). — Flot. Lich. Exs. (1829) n. 172 A, B p. p. (videas supr.). — Hepp Flecht. Eur. I (1853) n. 36 (sec. Arn. et Stizenb.). — Fellm. Lich. Aret. (1864) n. 196. — Arn. Lich. Exs. (1875) n. 635 a, b, (1888) n. 1397. — Zwackh Lich. Exs. (1880) n. 607. — Lojka Lich. Hung. Exs. IV (1882). — Malme Lich. Suec. Exs. I (1897) n. 15, VII (1910) n. 173. — Zahlbr. Krypt. Exs. Vindob. III (1898) n. 263 a, b.

Thallus crustaceus, uniformis, areolatus, areolis planis aut raro leviter convexis, minutis, tenuibus, cinereo-fuscescentibus aut raro cinereis, haud pruinosis, dispersis aut partim contiguis, KHO non reagentibus, medulla alba, jodo leviter violascente, hypothallo nigro. Apothecia minuta, nigra, nuda, plana aut planiuscula, tenuiter marginata aut immarginata. Epithecium vulgo pruinosum. Sporae 8-nae, decoloratae aut demum leviter obscuratae, submurales, long. 0.024—0.032, crass. 0.011—0.015 mm sec. Th. Fr. (long. —0.045, crass. —0.021 mm sec. Flagey Cat. Lich. Alg., 1896, p. 80).

Distr. Supra rupes, lapides et saxa, granitica, quartzosa et porphyrica, locis apricis crescit. Al.: (E. Nylander sec. Th. Fr. l. c. p. 626). Ab.: Lohja (C. E. Boldt). N.: Hoglandia (sec. determ. Nyl. in M. Brenner Bidr. Høgl. Lafv. p. 112), Helsingforsia (W. Nyl. sec. Th. Fr. l. c.), Gesterby in Kyrkslätt (G. Lång). Oa.: (A. J. Malmgren sec. Th. Fr. l. c.). LTul.: Ins. Kildin (N. I. Fellman Lich. Arct. n. 196 sec. determ. Nyl. in herb. suo, „L. petraea“ in Nyl. Lich. Lapp. Or. p. 162).

Thallus areolis 0.3—0.2 (—0.5) mm latis, laevigatis (raro albidis in var. *subalbicante* Nyl. aut obscure fuscescentibus in var. *subobscurata* Nyl. in Lamy Cat. Lich. Mont-Dore p. 171), „CaCl₂O₂ immutatis“ (sec. Th. Fr.). Apothecia lat. 0.4—0.7 mm, vulgo inter areolas thalli sita, late adnata, basi haud constricta, thallum leviter superantia, vulgo crebra, disco laevigato aut rarius subpapillato, margine tenui, leviter prominente aut excluso. Excipulum obscure atropurpureum. Hypothecium nigrofuscum. Paraphyses apice fuligineo-violascentes (sec. Th. Fr.) aut raro olivaceae vel obscure virides (sec. Arn.). „Sporae incoloratae vel demum pallide subolivaceae, 1—5-septatae, 2—8-loculares, halone crasso vel vulgo indistincto circumdatae. KHO paraphysum apices obscuriusque excipulum violaceo-rubescunt, HNO₃ tantummodo paullo dilutiores evadunt“ (sec. Th. Fr.). „Sterigmata simplicia. Conidia recta“ (sec. Flagey Fl. Lich. Franche-Comté p. 497), „acicularia, long. 0.010 mm“ (sec. Jatta l. c. p. 690). Gonidia cystococcoidea, globosa aut subglobosa, simplicia, diam. 0.012—0.006 mm, chromatophoro anguloso aut rarius chromatophoris 3—4, vacuolis lateralibus, membrana sat tenui.

Obs. 1. *L. distincta* f. *subecrustacea* Brenn. Bidr. Høgl. Lafv. (1885) p. 112, in rupe porphyrica Hoglandiae lecta, a me non est visa.

Obs. 2. *L. atroalba* α. *ambigua* Naeg. (1853) atque forsitan etiam *L. confervoides* β. *areolata* Schaer. (1850) nomina anteriora hanc speciem designantia sunt, quare in primis nomen *areolatae* restituendum esset, si revera huc pertinet. Lex nomenclaturae prioritatem nominis varietatis excludens est injusta, quare approbanda non est, praesertim quum significatio speciei valde vacillans est.

18. *Rh. hyalescens* Vain. (n. sp.).

Thallus crustaceus, uniformis, areolatus, areolis contiguus, incrassatis, leviter convexis aut planis, laevigatis, cinereo-fuscescentibus aut livido-cinerascentibus, haud pruinosis, KHO non reagentibus, medulla jodo plus minus distincte violascente, hypothallo nigro. Apothecia nigra, nuda, plana, inter areolas sita, haud prominentia, haud papillata, immarginata aut tenuiter marginata. Epithecium vulgo rubricosum-fuscescens. Sporae 8-nae, decoloratae aut parce demum dilute aeruginoso-nigricantes, long. 0.020—0.032, crass. 0.009—0.013 mm, diu 3-septatae, demum submurallidivisae, cellulis paucis.

Distr. In latere saxi granitici in litore sinus Viburgensis prope Papula Viburgi („*L. distincta*“ in Vain. Lich. Vib., 1878, p. 68). In saxo granitico ad Tölö Helsingforsiae (Vain.).

Thallo crassiore et apotheciis haud prominentibus a *Rh. distincto* differens, f. *aeruginascente*, sporis demum obscuratis instructa, in *Rh. grandem* fere transit et forsan regressu ab eo evolutum. Thallus sat crassus aut modice incrassatus, crass. 0.5—0.2 mm, areolis angulosis, difformibus, lat. 1.5—0.2 mm, medulla KHO cum CaCl_2O_2 non reagente. Apothecia lat. 0.4—0.8 mm, saepe angulosa, late adnata, basi haud constricta, disco laevigato. Perithecium fuscofuligineum. Hypothecium rubricosofuscescens. Epithecium rubricosum-fuscescens aut raro parce aeruginosofuligineum. Paraphyses apice leviter incrassatae. Sporae strato gelatinoso sat crasso indutae, primum septis 3 transversis, loculo uno aut loculis duobus septo uno longitudinali oblique divisus. Gonidia cystococcoidea, globosa, diam. 0.008—0.014 mm, chromatophoro anguloso, vacuolis lateralibus, membrana sat tenui. Partes rubricosum-fuscescentes, KHO distinctius purpureae evadunt.

F. aeruginascens Vain.

Sporae long. 0.023—0.028, crass. 0.011—0.016 mm, primum 1-septatae, deinde irregulariter divisae, cellulis 5—6, demum aeruginoso-obscuratae. Thallus modice incrassatus, areolis planis, contiguus, livido-cinerascentibus. Apothecia haud prominentia, margine haud aut parum distincto. Hypothecium et epithecium rubricosum-fuscescentia, KHO solutionem purpuream effundentia.

Distr. Supra lapidem ad Tervaniemi Viburgi („*L. distincta*“ in Vain. Lich. Vib. p. 68).

19. *Rh. reductum* Th. Fr.

Lich. Scand. II (1874) p. 633. *Lecidea lavata* **L. reducta* Nyl. in Elfv. Ant. Veg. Svir (Meddel. Soc. F. Fl. Fenn. II, 1878) p. 169. *L. reducta* Nyl. in Lamy Cat. Lich. Mont-Dore (1880) p. 131 (excl. specim. Gall.).

Exs. Arn. Lich. Exs. (1897) n. 1738 („*planta Danica*“).

Thallus crustaceus, uniformis, verrucosus, verrucis minutis, convexis, laevigatis, cinereis aut cervinis vel cinereo-fuscescentibus, haud pruinosis, contiguis, nec KHO, nec (sec. Th. Fr.) jodo reagentibus, hypothallo nigro. Apothecia minuta, nigra, nuda, inter verrucas thalli sita et vulgo thallum subaequantia, plana aut raro demum convexa, haud papillata, tenuiter marginata aut mox immarginata. Epithecium aeruginoso-fuligineum aut „olivaceo-fuscescens“ (sec. Th. Fr.). Sporae 8-nae, decoloratae, submurales-divisae, long. circ. „0.022—0.036, crass. 0.010—0.016 mm“ (sec. annot. Nyl.).

Distr. Supra rupes graniticas et gneissaceas ad Vaa in Hollola in Ta. (leg. Vain., determ. Nyl.) et ad Vossenssenje in KOL. (F. Elfving, det. Nyl.).

Proximum est *Rh. hyalescenti*, quod thallo jodo subviolascens, areolis planis aut minus convexis et epithecio rubricoso-fuscescente ab eo differt. Specimina Tirolica et Gallica, huc a Nyl. ducta, areolis thalli planis a speciminibus Fennicis differunt. — Thallus verrucis 0.5—0.2 mm latis, modice incrassatis. Apothecia crebra, lat. circ. 0.4—0.7 mm, late adnata, basi haud constricta, disco laevigato. Perithecium subfusco-fuligineum. Hypothecium rubricoso-fuligineum. Epithecium in specim. Fennicis aeruginoso-fuligineum. Hymenium circ. 0.110 mm crassum, gelatinosum. Sporae septis transversis 3—4, vulgo tantum uno loculo septo uno longitudinali obliquove diviso, tantummodo morbosae aeruginosae. Gonidia cystococcoidea, globosa aut subglobosa, diam. 0.010—0.006 mm, simplicia, membrana sat tenui. — *L. postumans* Nyl. in Sandst. 3 Nachtr. p. 490 (Zwackh Lich. Exs. n. 1189) facie externa huic subsimilis est.

20. *Rh. postumum* (Nyl.) Th. Fr.

Lich. Scand. II (1874) p. 634; A. Smith Mon. Brit. Lich. II (1911) p. 196. *Lecidea postuma* Nyl. Fl. 1868 p. 345 (conf. infra), En. Lich. Fret. Behr. (1888) p. 59 (herbario Nyl. deest), Lich. Jap. (1890) p. 82 (herb. Nyl. deest); Leight. Lich. Great Brit. 3 ed. (1879) p. 349; Hue Addend. II (1888) p. 217.

Thallus crustaceus, uniformis, tenuis, sat evanescens, impure albidus, haud pruinosis, nec KHO, nec jodo reagens, hypothallo indistincto. Apothecia parva aut minutissima, nigra, nuda, leviter prominentia, disco plano, vulgo haud papillato, tenuiter marginata. Epithecium rubricosum. Sporae 8-nae, decoloratae aut demum fumosae vel dilute nigricantes subfuscescentesve, submurales, septis transversis 3, long. 0.014—0.017 mm (—0.011 mm sec. Th. Fr.), crass. 0.006—0.009 mm.

Distr. In rupe micaceo-schistosa ad Letku in Tammela in Ta. (A. Kullhem).

In hoc specimine thallus est variabilis, minute verruculosus dispersusque aut partim subcontinuus et verruculoso-inaequalis. Apothecia crebra, lat. 0.2—0.3 mm, parce etiam —0.6 mm, tenuia, substrato late adnata, basi haud constricta, disco raro papillato, partibus rubricosis KHO pulchrius coloratis. Perithecium fusco-aut rubricosofuligineum. Hypothecium rubricosofuligineum. Hymenium circ. 0.120 mm crassum. Epithecium rubricosum aut subfuscescens. Paraphyses gelatinam sat abundantem percurrentes, sat increbre septatae, crass. 0.0015 mm, apice circ. 0.003 mm. Sporae septis transversis 3, uno loculo septo uno longitudinali diviso, strato gelatinoso tenui saepe indutae. Gonidia globosa, simplicia, diam. 0.008—0.006 mm, membrana tenui.

Obs. Specimen orig. *L. postumae* Nyl., n. 10144 e Scotia in herb. Nyl., thallo instructum est tenui, areolato, areolis 0.2—0.5 mm latis, difformibus, planis aut convexis, laevigatis aut parce subverruculosis, albidis, subdispersis, hypothallo indistincto, apotheciis 0.2—0.3 mm latis, leviter prominentibus, tenuiter marginatis, disco plano, laevigato, haud aut leviter papillato, „epithecio fuscescente, sporis long. 0.015—0.016, crass. 0.006—0.007 mm, incoloribus (vel fuscescentibus), 3-septatis (additis saepius septulis obliquis vel longitudinalibus parcis)“, sec. Nyl. l. c.

21. *Rh. subreductum* Vain.

Lecidea postuma **L. subreducta* Vain. Adj. Lich. Lapp. II (1883) p. 142.

Thallus crustaceus, uniformis, areolatus, areolis minutis, subplanis aut valde depresse subconvexis, laevigatis, cervinis vel cinereo-subfuscescentibus, haud pruinosis, contiguus, sat tenuibus aut fere modice incrassatis, nec KHO, nec jodo reagentibus, hypothallo indistincto aut leviter evoluta nigricanteque. Apothecia minuta, inter areolas thalli sita et thallum subaequantia aut demum leviter vel parum prominentia, plana aut demum levissime depresso-convexa, vulgo subpapillata, papilla parum prominente, nigra, nuda, tenuiter marginata aut mox immarginata. Epithecium olivaceum aut olivaceo-fuligineum. Sporae 8-nae, decoloratae, persistenter 3-septatae, long. 0.015—0.025, crass. 0.007—0.009 mm.

Distr. OKaj.: Cum *Lecanora lacustri* ad saxa granitica in rivulis prope Saukko et Templum in par. Kianta (Vain.).

Facie externa subsimile est *Rh. reducto*, areolis thalli minus convexis, disco vulgo subpapillato, et sporis haud murali-divisis ab eo differens. Thallus areolis difformibus, 0.2—0.4 (—0.5) mm latis. Apothecia crebra, lat. circ. 0.5—0.7 mm, late adnata, basi haud constricta. Perithecium fusco- aut subrubricosum-fuligineum aut in margine superne olivaceo-nigricans. Hypothecium rubricosum- aut subfusco-fuligineum. Hymenium 0.090—0.060 mm crassum, gelatinosum, jodo caerulescens, ascis demum vinose rubentibus. Paraphyses cellulis vulgo oblongis. Sporae distichae, decoloratae aut raro demum dilute aeruginoso-fumosae, strato gelatinoso sat crasso. Gonidia cystococcoidea, globosa aut subglobosa, diam. 0.007—0.016 mm, simplicia, membrana sat tenui, vacuolis lateralibus.

22. *Rh. submodestum* Vain.

Lecidea submodesta Vain. Adj. Lich. Lapp. II (1883) p. 137.

Thallus verruculis minutissimis, parcissimis, hypothallo indistincto. Apothecia sat parva, nigra, nuda, disco haud papillato, laevigato aut leviter subscabrido, plano aut raro depresso-convexo, margine tenui, persistente. Epithecium

subaeruginoso-nigricans aut subolivaceo-fuligineum. Sporae 8-nae, decolores aut demum obscuratae, persistenter 3-septatae, long. 0.014—0.022, crass. 0.007—0.009 mm.

Distr. LIn.: Ad rupem granuliticam in reg. subalp. jugi Suoloselkä (Vain.).

Thallus verruculis minutissimis obscuratis indicatus. Apothecia partim aggregata contiguave, lat. 0.3—0.5 mm, late adnata, basi leviter constricta, saepe angulosa, margine leviter prominente, saepe leviter subflexuoso. Perithecium subpurpureo-fuligineum. Hypothecium rubricosio-fuligineum, KHO distinctius rubricosum. Epithecium KHO subolivaceo-fuligineum. Hymenium circ. 0.100—0.080 mm crassum, jodo caerulescens. Paraphyses gelatinam minus abundantem percurrentes, cellulis vulgo oblongis, apice leviter incrassatae. Sporae p. p. demum aeruginoso-obscuratae aut subnigricantes, strato gelatinoso sat crasso.

23. *Rh. tetramerum* Vain.

Lecidea postuma var. *tetramera* Vain. Adj. Lich. Lapp. II (1883) p. 141.

Thallus crustaceus, uniformis, subverrucosus areolatusve, areolis minutis, dispersis, depresso-convexis, tenuibus, laevigatis, cervinis vel cinereo-fuscescentibus, haud pruinosis, nec KHO, nec jodo reagentibus, hypothallo nigro. Apothecia minutissima, nigra, nuda, leviter prominentia, disco plano, vulgo haud papillato, tenuiter marginata. Epithecium aeruginoso-olivaceum aut olivaceo-fuscescens. Sporae 8-nae, decoloratae, 3-septatae, long. 0.015—0.020, crass. 0.006—0.009 mm.

Distr. In latere rupis chloritico-schistosae ad Vuosiemi in par. Repola in KVien. occ. (Vain.).

Thallus areolis 0.3—0.5 mm latis. Apothecia crebra, lat. 0.25—0.3 mm, late adnata, basi haud constricta, disco sat laevigato, rarissime minutissimeque papillato. Perithecium fuscescenti-aeruginoso-fuscescenti-fuligineum. Hypothecium fusco-fuligineum. Hymenium circ. 0.070—0.080 mm crassum, gelatinosum, jodo caerulescens, demum ascis vinose rubentibus. — N. 10141 in herb. Nyl., prope Klagenfurt in Tirolia ab Arn. lectus, „*L. subpostuma*“ a Nyl. denominatus, facie externa et sporis 3-septatis similis est plantae nostrae, epithecio fuscescente, verruculis

thalli partim contiguis et sporis 0.017—0.023 mm longis ab ea differens, sed primarium *Rh. subpostumum* (Nyl.) Arn., Lich. Tirol XVII (1877) p. 554 (n. 10140 in herb. Nyl.) thallo sordide albido, areolis contiguis, apotheciis majoribus (0.6—0.4 mm latis), „sporis long. 0.018—0.022, crass. 0.008—0.009 mm, decoloratis et demum viridulis fuscidulisve, submuralibus, epithecio violascente vel caerulescente variante“ (sec. annot. Nyl. et Arn.) a *Rh. tetramero* differt.

Sect. II. *Catocarpus* (Koerb.) Th. Fr.

Rhizocarpon A. *Catocarpon* Th. Fr. Lich. Scand. II (1874) p. 612. *Buellia* sect. I. *Catocarpus* Koerb. Syst. Lich. Germ. (1855) p. 223 (em.). *Catocarpus* Arn. Lich. Fragm. XII (Fl. 1871) p. 147 (em.), Lich. Münch. (1891) p. 93.

Sporae persistenter 1-septatae.

In *Rh. atroalbente* (Nyl.) Vain. (Lich. Exp. Vegae Pitlekai p. 113) sporae saepe demum p. p. subtriseptatae, septis 2 accessoriis tenuibus).

24. *Rh. chionophiloides* (Vain.) Lettau

Nachw. Flechtensäur. (Hedwigia 1914) p. 76 (subsp.). *Lecidea chionophila* **L. chionophiloides* Vain. Adj. Lich. II (1883) p. 124, Lich. Nov. Semlj. (Hedwigia, Beibl., 1898) p. 86, Lich. Exp. Vegae Pitlekai (1909) p. 112. *L. atroalbescens* Nyl. Fl. 1884 p. 216 et En. Lich. Fret. Behr. (1888) p. 38 (p. p.).

Thallus crustaceus, ambitu subeffiguratus aut uniformis, areolatus, areolis planis aut raro depresso-convexis, contiguis aut raro dispersis, citrinis aut raro cinereo- vel pallido-flavescentibus aut partim albido-variegatis, haud pruinosis, laevigatis, esorediatis, KHO lutescentibus deindeque rubescentibus aut tantum addito CaCl_2O_2 rubescentibus, intus albis et jodo caerulescentibus, hypothallo nigro. Apothecia vulgo mediocria, nigra, nuda, disco plano et saepe demum convexo, haud papillato, margine tenui, persistente aut demum excluso. Sporae 8-nae, demum obscuratae, long. 0.022—0.038, crass. 0.009—0.014 mm, 1-septatae.

F. *catolechioides* Vain.

Thallus areolis planis, contiguis, aut plagas dispersas, contigue areolatas formans, citrinus, KHO demum bene rubescens, medulla jodo intense caerulescente.

Distr. KKER.: Supra rupem gabbroiticam in reg. subalp. montis Kivakka („*L. chionophiloides*“ Vain. Adj. Lich. Lapp. II p. 124).

Thallus modice incrassatus, areolis angulosis, difformibus, saepe circ. 1.2—0.5 mm latis, planis. Apothecia saepe irregulariter aggregata. Epithecium aeruginoso- aut subolivaceo-fuligineum. Hymenium jodo caerulescens. Sporae long. 0.022—0.038, crass. 0.010—0.013 mm, primum decoloratae, dein nigricantes aut fusco-nigricantes.

F. anoicheia (Vain.) Lettau. **Rh. chionophilum* **Rh. chionophiloides* f. *anoicheium* Lettau l. c. **L. chionophiloides* f. *anoicheia* Vain. l. c.

Thallus areolis planis aut raro depresso-convexis, contiguis aut raro partim subdispersis, aut plagas dispersas, contiguae areolatas, formans, citrinus aut flavescens, KHO demum rubescens aut maculis rubescentibus, medulla dilute caerulescente.

Distr. Kuus.: Supra rupem graniticam in reg. subalp. montis Nuorunen (Vain.). LTul.: Kitofka (N. I. Fellman, „*L. aglaea*“ sec. Nyl. Lich. Lapp. Or. p. 160, „*Rh. chionophilum*“ sec. Th. Fr. l. c. p. 535), ad Sinum Kuollaënsem (Fellm., „*L. alpicola*“ sec. Nyl. l. c. p. 166).

Thallus modice incrassatus aut raro sat crassus, areolis planis aut raro depresso-convexis, angulosis, difformibus, circ. 1.5—0.5 mm latis. Apothecia irregulariter aggregata aut dispersa, lat. 0.8—1.6 mm. Epithecium aeruginoso- aut olivaceo- aut raro subpurpureo-fuligineum. Hypothecium et perithecium fusco- aut subpurpureo-fuligineum. Paraphyses cellulis oblongis, gelatinam sat abundantem percurrentes. Sporae diu decoloratae, demum fuliginiae, saepe medio leviter constrictae, long. circ. 0.024—0.034, crass. 0.010—0.013 mm, strato gelatinoso sat crasso.

F. subnegans Vain. **L. chionophiloides* f. *subnegans* Vain. l. c.

Thallus areolis planis, contiguis aut plagas dispersas, contiguae areolatas, formans, citrinus aut flavescens, KHO passim dilute rubescens, passim pallide coloratum et addito CaCl_2O_2 rubescens, medulla jodo intense caerulescente.

Distr. Ad rupem dioriticam in reg. subalp. montis Ukonvaara in Kuus. (Vain.), una cum *Rh. chionophilo*.

Thallus modice incrassatus, areolis planis, angulosis. Epithecium fusco-nigricans. Hypothecium fusco-nigricans. Hymenium circ. 0.140 mm crassum. Sporae long. circ. 0.024—0.030, crass. 0.010—0.012 mm.

Obs. *Rh. chionophiloides* variat thallo disperso, verrucoso, verrucis depresso-convexis, rotundatis, p. p. albidis et cinereo- et pallido-flavescentibus. Conf. f. *variegata* Vain. (Lich. Nov. Semlj. p. 86) et f. *orientalis* Vain. (Lich. Exp. Vegae Pitlekai p. 112).

Rh. superficiale (Schaer.) Vain.

Lecidea superficialis Schaer. Spic. Lich. Helv. III (1828) p. 125, 193, En. Lich. Eur. (1850) p. 107 (sec. Arn. Lich. Tirol XXV p. 384); Fr. Lich. Eur. Ref. (1831) p. 325. *L. geographica* ϵ . *sphaerica* Schaer. Lich. Helv. Spic. III (1828) p. 123, 193 (sec. Müll. Arg. et Arn.). *Catocarpus sphaericus* Arn. Lich. Tirol XXV (1893) p. 384, Lich. Exs. Index (1894) p. 38. *L. geographica* η . *conglomerata* Schaer. Lich. Helv. Exs. XXIII (1849) n. 577 (sec. Stizenb. Lich. Helv. p. 212), haud Fr. Lich. Eur. Ref. (1831) p. 237. *Buellia effigurata* Anzi Cat. Lich. Sondr. (1860) p. 90 (verisim. p. p.), Lich. Rar. Langob. VII (1861) n. 284 sec. Arn. Fl. 1871 p. 148 et Th. Fr. l. c., sed haud in herb. Nyl. (videas infra). *Rhizocarpon effiguratum* Th. Fr. Lich. Scand. II (1874) p. 613. *Catocarpus effiguratus* Arn. Fl. 1871 p. 148, Lich. Tirol XIV (1875) p. 444. *Lecidea effigurata* Vain. Lich. Exp. Vegae Pitlekai (1909) p. 114. *Catocarpus Anzianus* Müll. Arg. En. Lich. Valais. (1881) p. 18 (ut videtur). *Lecidea subalpicola* Nyl. En. Lich. Fret. Behr. (1888) p. 39 (in herb. Nyl.).

Exs. Arn. Lich. Exs. (1892) n. 1556. — Havaas Lich. Norv. Exs. (1907) n. 366, Lich. Norv. Occ. Exs. II (1913) n. 48.

Thallus crustaceus, uniformis aut ambitu subeffiguratus, verrucosus, verrucis convexis, et p. p. areolatus, areolis planis, citrinus aut citrino-flavescens, epruinosis, laevigatus, esorediatus, KHO non reagens aut levissime lutescens, medulla jodo caerulescente, hypothallo nigricante. Apothecia sat parva aut mediocria, nigra, nuda, disco plano aut demum convexo, laevigato, margine sat tenui, saepe demum excluso. Sporae 8-nae, demum obscuratae, long. circ. 0.011—0.022, crass. 0.007—0.012 mm (sec. Arn. et Vain.), 1-septatae.

Distr. Ad rupes schistosas in montibus Norvegiae (Havaas Beitr. Kenntn. Westnorw. Flecht. I, 1909, p. 32) et Lapponiae Lulensis (Th. Fr. l. c.) et in Sibiria arctica (Vain. l. c., Nyl. l. c.) proveniens, in Fennia nondum collectum est.

Obs. In Anzi Lich. Rar. Langob. n. 284 in herb. Nyl. thallus nec KHO, nec jodo reagens, hypothallo indistincto, apotheciis 0.4 mm latis, sporis (sec. Nyl.) long. 0.014—0.018, crass. 0.008—0.010 mm.

25. Rh. Inarense Vain.

Lecidea chionophila **L. Inarenis* Vain. Adj. Lich. Lapp. II (1883) p. 124, Lich. Nov. Semlj. (Hedwigia Beibl. 1898) p. 86.

Thallus crustaceus, uniformis, verrucosus subareolatusve, verrucis depresso aut bene convexis, albis aut persicinino-albidis, subpruinosis vel epithallo minutissime diffracto, esorediatis, supra hypothallum nigrum dispersis, hydrate

kalico lutescentibus deindeque rubescentibus, intus albis et jodo haud reagentibus. Apothecia sat parva aut fere medio-cria, nigra, nuda, disco primum plano, demum convexo, laevigato, margine sat tenui, demum excluso. Sporae 8:nae, demum nigricantes, long. 0.022—0.032, crass. 0.010—0.013 mm, 1-septatae.

Disrt. In latere rupis graniticae ad Veskonieni in reg. pinifera in LIn.

Thallus modice incrassatus, verrucis 1—0.6 mm latis, sat irregularibus aut rotundatis, KHO solutionem luteam effundentibus deindeque crystalli rubra acicularia formantibus. Apothecia lat. circ. 1—0.5 mm, demum bene prominentia. Perithecium sub-fusco-fuligineum. Hypothecium rubricosum aut fusciscenti-fuligineum. Hymenium circ. 0.120 mm crassum, jodo persistenter caerulescens. Epithecium olivaceo- aut p. p. aeruginoso-fuligineum, KHO non reagens. Paraphyses gelatinam sat abundantem percurrentes, parce ramoso-connexae, cellulis oblongis aut ellipsoideis, apice saepe leviter incrassatae. Sporae distichae, medio raro leviter constrictae, strato gelatinoso sat crasso indutae. Gonidia cystococcoidea, simplicia, globosa, diam. 0.008—0.013 mm, vacuolis lateralibus, membrana sat tenui.

26. *Rh. chionophilum* Th. Fr.

Lich. Scand. II (1874) p. 612 p. p. *Lecidea chionophila* Vain. Adj. Lich. Lapp. II (1883) p. 122. *Catocarpus alpicolus* Müll. Arg. En. Lich. Valais. (Bull. Soc. Murith. du Valais, 1881) p. 18.

Exs. Zahlbr. Lich. Rar. Exs. Vindob. I (1903) n. 25 (f. *decolorata*) sec. Lynge Ind. Lich. Exs. II p. 269. — Claud. et Harm. Lich. Gall. Exs. VII (1905) n. 345 (sec. Lynge l. c. p. 162). — Malme Lich. Suec. Exs. XIV (1913) n. 347.

Thallus crustaceus, uniformis aut rarius ambitu sub-effiguratus, areolatus, areolis planis aut rarius convexis, dispersis aut subcontiguis, flavescentibus citrinisve aut partim albidis, haud pruinosis, laevigatis, esorediatis, KHO lutescentibus deindeque rubescentibus, intus albis et jodo haud caerulescentibus, hypothallo nigro. Apothecia vulgo medio-cria, vulgo prominentia, nigra, nuda, disco plano et vulgo demum convexo, laevigato, margine vulgo sat tenui, persistente aut demum excluso. Sporae 8:nae, demum obscuratae, long. 0.021—0.030, crass. 0.010—0.012 mm, 1-septatae.

Distr. Ad saxa granitica, gneissacea et granulitica in reg. subalp. montium Ukonvaara et Nuorunen (f. decolorata) in Kuus. (Vain.), in Seidevaara in LIn. (F. Silén), Katschkova in LPon. (N. I. Fellman, „L. aglaea“ in Nyl. Lich. Lapp. Or. p. 160 sec. specim. in mus. Fenn., f. Fellmani Vain.).

Thallus modice incrassatus (aut raro sat crassus in f. Fellmani), areolis laevigatis, angulosis difformibusque aut raro rotundatis, lat. 0.3—0.8 (—1.5) mm. Apothecia lat. 0.7—1 (0.6—1.5) mm, irregulariter aggregata aut sat dispersa, vulgo thallum superantia. Hypothecium fusco- aut subrubricoso-nigricans. Epithecium nigricans aut aeruginoso-nigricans aut raro violaceo-fuscescens. Sporae distichae, primum decolores, demum aeruginoso- aut fusco-nigricantes. Gonidia cystococcoidea, simplicia, globosa aut raro subglobosa, diam. 0.008—0.014 mm, membrana sat tenui aut modice incrassata, vacuolis lateralibus, saepe etiam autosporas subellipsoideas, haud numerosas continentia.

F. primaria Vain.

Thallus areolis planis, vulgo angulosis, flavescentibus citrinisve.

Distr. Ex Ukonvaara et Seidevaara supra indicata.

Thallus KHO demum praecipitatum granulosum rubrum et crystallalla acicularia rubra in eadem areola formans.

F. decolorata (Vain.) Zahlbr. Lich. Rar. Exs. II (1903) n. 25. *L. chionophila* var. *decolorata* Vain. Adj. Lich. Lapp. II p. 123.

Thallus albus, partim citrinus.

Distr. Supra rupem graniticam in reg. subalp. montis Nuorunen in Kuus. (Vain.).

Thallus plagis rimosis et diffractis, majoribus minoribusque, planis, sat tenuibus, supra hypothallum nigrum dispersis. Apothecia irregulariter aggregata contiguave, thallum haud superantia, disco plano, margine modice incrassato aut sat tenui, saepe leviter prominente. Hypothecium fusconigrum. Epithecium sordide violaceo-fuscescens. Sporae primum decolores, dein aeruginosae demumque nigricantes, medio leviter constrictae, long. 0.025—0.029, crass. 0.010—0.013 mm.

F. Fellmani Vain.

Thallus areolis convexis, vulgo rotundatis, verrucaeformibus, subcitrinis.

Distr. Ad saxa granulitica in Katschkova inter Ponoï et Lumbovski in LPon. (supra indicata).

Thallus verrucis sat crassis, 1—0.3 mm latis, contiguus aut p. p. dispersis, vulgo bene convexis, KHO lutescentibus deindeque rube-scentibus, jodo non reagentibus, hypothallo nigro aut aetate demum cinerascente rimulosoque. Apothecia lat. 0.7—1.5 mm, thallum bene superantia, demum bene convexa immarginataque, haud papillata. Hypothecium subrubricoso-nigricans. Hymenium circ. 0.190 mm crassum. Epithecium aeruginoso-nigricans. Paraphyses cellulis vulgo oblongis, gelatinam haud valde abundantem percurrentes. Sporae 1-septatae, demum fusco-nigricantes, long. circ. 0.018 0.022, crass. 0.009—0.012 mm, strato gelatinoso sat tenui saepe indutae.

Obs. *F. ludibunda* Th. Fr. (Lich. Scand. II p. 612), „crusta passim substraminea, vulgo stramineo- v. viridulo-cinerascente, areolis crustam subcontiguam formantibus hypothallumque tegentibus“, in Finmarkia collecta est.

27. *Rh. oreites* (Vain.) Zopf

Ann. Chem. 338 p. 53, Flechtenst. (1907) p. 402. *Lecidea oreites* Vain. Adj. Lich. Lapp. II (1883) p. 126. *L. alpicola* Hepp Flecht. Eur. I (1853) tab. XVIII, n. 151 (sec. Stizenb. Lich. Helv. p. 212), haud *L. atro-virens* β . *alpicola* Wahlenb. Fl. Lapp. (1812) p. 474 (sec. Th. Fr. Lich. Scand. p. 623); Nyl. Lich. Scand. (1861) p. 247 p. p., Lich. Lapp. Or. (1866) p. 166 p. p. *Catocarpus alpicolus* Arn. Lich. Tirol XXV (1893) p. 382. *Rh. alpicola* Malme Lich. Suec. Exs. XIV (1913) n. 348. *Rh. chionophilum* Th. Fr. Lich. Scand. II (1874) p. 612 p. p. (sec. determ.).

Exs. Flot. Lich. Exs. II (1829) p. 7, n. 162 A, B (sec. Koerb. Parerg. Lich. p. 234). — Hepp Flecht. Eur. I (1853) n. 151 (sec. Stizenb.). — Anzi Lich. Rar. Langob. V (1861) n. 199 (sec. Stizenb. l. c.). — Rabenh. Lich. Eur. Exs. XXII (1861) n. 618. — Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 347. — Zwackh Lich. Exs. (1883) n. 798. — Harm. Lich. Lothar. n. 345 (sec. Lettau Nachw. Flechtensäur. p. 32). — Malme Lich. Suec. Exs. XIV (1913) n. 348.

Thallus crustaceus, uniformis, areolatus aut raro verrucosus, areolis planis aut raro convexis, supra hypothallum nigrum dispersis, aut plagas circ. 1—40 mm latas, rimulosas aut rimoso-diffractas, vulgo laevigatas formans, citrinus aut citrino-flavescens aut raro partim subalbidus, haud pruinosis, esorediatus, intus albus, nec KHO, nec jodo reagens. Apothecia vulgo mediocria aut raro majuscula, thallum haud aut parum superantia et vulgo quasi thallo immersa, nigra, nuda, disco plano aut raro depresso-convexo, margine tenui aut

sat tenui, subpersistente. Sporae 8-nae, demum obscuratae, long. 0.021—0.035, crass. 0.010—0.014 mm, 1-septatae.

Distr. Supra rupes et saxa, granitica et quartzitica, locis apertis ventosisque crescit. Frequenter in Lapponia sec. annotationes meas (Vain. l. c.), „pluribus locis in reg. alp. et verisim. sat frequens“ sec. Norrl. (Ber. Torn. Lappm. p. 341), in reg. subalp. montium Iivaara, Nuorunen, Ukonvaara, Mäntyunturi (in Kuus.) et Kivakka (in KKER.) sec. annot. meas. Specim. ex locis sequ. examinavi. LMurm.: Olenji (N. I. Fellman). LPon.: Ad lapides in tundra ad Orlov (Kihlm. Neue Beitr. Flecht. Kola p. 59). Llnar.: Leviävaara (F. Silén). LKem.: Olostunturi in Muonioniska, Lompolo-tunturi (Norrl., f. gerontoides) et Levitunturi (E. Nylander) in Kittilä, Pyhätunturi in Sodankylä (Vain., f. soluta). Kuus.: Iivaara, Nuorunen (Vain.). Ob.: Pahnilankangas in Simo (V. Räsänen). N.: Ad Meilans (Vain.). „L. alpicola“ ex Hoglandia (Brenner l. c. p. 118) sec. specim. in mus. Fenn. est Rh. geographicum.

Thallus modice incrassatus aut crassus, KHO solo (conf. infra) aut addito CaCl_2O_2 vulgo haud distincte reagens. Apothecia lat. circ. 1—1.5 (0.7—1.7) mm, ex hypothallo enata, sed demum vulgo thallo immersa apparent, saepe sat crebra aut irregulariter aggregata contiguave, interdum discis parce papillatis. Perithecium rubricosum-fuligineum. Hypothecium fusconigrum. Hymenium gelatinosum, jodo persistenter caerulescens. Epithecium violaceo-vel rubricosum- aut olivaceo-fuligineum. Sporae primum decoloratae, dein aeruginosae nigricantesve, saepe medio constrictae, saepe strato gelatinoso modice incrassato indutae. Thallus acidum rhizocarpicum et psoromicum continens sec. Zopf l. c. Gonidia cystococcoidea, simplicia, globosa aut subglobosa, diam. circ. 0.007—0.016 mm, membrana sat tenui. — In „Rh. alpicola“ Flagey (Fl. Lich. Franche-Comté p. 490), quod autem non est bene limitatum, conidia „cylindrica recta“ describuntur.

F. soluta (Bagl. et Carest.) Vain. *Buellia alpicola* β . *soluta* Bagl. et Carest. Catal. Lich. Vals. (Comm. Critt. It. II, 1867, p. 241), Anacr. Lich. Vals. II (1881) p. 281. *Lecidea oreites* f. *soluta* Vain. Adj. Lich. Lapp. II p. 127.

Thallus areolis convexis, verrucaeformibus, supra hypothallum nigrum dispersis, albidis aut p. p. etiam flavescentibus in eodem specimine.

Distr. Supra rupem quartziticam in reg. subalp. montis Pyhä-tunturi in Sodankylä in LKem. (Vain.).

Thallus KHO haud distincte reagens, medulla jodo non caerulescens. Perithecium rubricosum-fuliginosum. Epithecium rubricosum-fuliginosum, KHO distinctius rubricosum. Sporae 1-septatae, long. 0.024–0.026, crass. 0.009–0.013 mm, medio constrictae.

F. gerontoides (Nyl.) Vain. *Lecidea alpicola* f. *gerontoides* Nyl. in Norrl. Ber. Torn. Lappm. (1873) p. 341. *Rh. chionophilum* f. *gerontoides* Th. Fr. Lich. Scand. II p. 612.

Thallus areolis planis, supra hypothallum nigrum dispersis, albidis.

Distr. Ad saxa dioritica in Lompolutunturi in Kittilä in LKem. (Norrl.). Specimen thallo flavo instructum, in monte Nuorunen in Kuus. collectum, p. p. in hanc formam transit, etiam areolas albas habens.

Huc etiam Malme Lich. Suec. Exs. n. 348 p. min. p. pertinet. — Diversa est *Lecidea gerontoides* Stirt. For. Lich. p. 165.

28. *Rh. Rittokense* (Hellb.) Th. Fr.

Lich. Scand. II (1874) p. 615. *Buellia Rittokensis* Hellb. Lich. Ant. Lule Lappm. (Öfv. K. Vet.-Ak. Förh. 1865) p. 463. *Lecidea* Nyl. H. L. F. n. 345; Vain. Adj. Lich. Lapp. II (1883) p. 130, Lich. Exp. Vegae Pitlekai (1909) p. 116. *Catocarpon Rittokense* Hellb. Norrl. Lafv. (K. Sv. Vet.-Ak. Handl. B. 20 N. 8, 1884) p. 106.

Exs. Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 345.

Thallus areolis squamaeformibus, vulgo rotundatis angulosive, sat parvis, planis aut vulgo concavis, castaneo-fuscis aut fusco-badiis rufescentibusve, nitidis, margine toto adscendente elevatoque, cinerascens aut raro nigricans, opaco, subtus obscuratis, supra hypothallum nigrum dispersis aut rarius p. p. contiguus, basi vulgo bene constrictis, intus albis, KHO non reagentibus, jodo vulgo caerulescentibus. Apothecia vulgo mediocria, nigra, nuda, disco plano aut demum depresso-convexo, haud papillato, margine sat tenui, subpersistente. Sporae 8-nae, primum decoloratae, demum aeruginoso-nigricantes, long. circ. 0.021–0.024 mm

(sec. annot. Nyl. 0.023—0.032 mm), crass. circ. 0.012—0.014 mm (—0.018 mm sec. annot. Nyl.), 1-septatae.

Distr. Ad saxa gabbroïtica et granitica in montibus rara. LIn.: In reg. subsylvat. sup. ad Edleljärvi (F. Silén, H. L. F. n. 345). KKER.: In reg. subalp. montis Kivakka (Vain. l. c.).

Thallus sat tenuis, squamis interdum, zona gonidiali fere totis impletis, jodo haud distincte reagentibus. Hypothallus KHO sordide violaceo-fuscescens. Apothecia vulgo areolis immixta, lat. circ. 1—0.5 mm. Perithecium rubricosum-fuliginosum. Hypothecium fusco-nigrum. Hymenium circ. 0.100 mm crassum, jodo caerulescens. Epithecium rubricosum-fuliginosum, KHO distinctius violaceum. Paraphyses gelatinosam abundantem percurrentes. Sporae medio vulgo demum leviter constrictae, strato gelatinoso crasso indutae. Gonidia cystococcoidea, simplicia, globosa, diam. 0.007—0.014 mm, aut ellipsoidea et long. 0.016—0.012, crass. 0.009 mm, membrana sat tenui, vacuolis lateralibus. — Facie externa subsimile est *Rh. leptolepidi* Anzi.

29. *Rh. badioatrum* (Floerk.) Th. Fr.

Lich. Scand. II (1874) p. 613. *Lecidea badioatra* Floerk. in litt. 1815 sec. Schaer. Lich. Helv. Spic. III (1828) p. 129; Schaer. Naturw. Anz. Aug. 1818 p. 9 n. 6; Spreng. Neue Entd. II (1821) p. 95; Nyl. Lich. Mont-Dore (1856) n. 53, Prodr. Lich. Gall. (1857) p. 375 (129) emend., Lich. Scand. (1861) p. 233; Vain. Adj. Lich. Lapp. II (1883) p. 127. *Lichen atroalbus* Wulf. in Jacq. Collect. Bot. II (1788) p. 185 n. 181 (tab. XIV f. 1) p. p. (sec. Arn. Zur Erinn. Wulf., 1882, p. 149, *L. atroalbus* L., Spec. Plant. II, 1753, p. 1141, exactius haud cognitus). *Lecidea atroalba* Fr. Lich. Suec. Exs. XIII (1827) n. 382 B p. p. (sec. Th. Fr.), haud Ach. *L. atroalba* Flot. */. grandis* Flot. in Zwackh Lich. Exs. (1853) n. 202. *L. atroalba* Nyl. Prodr. Lich. Gall. (1857) p. 375 (129) p. p., Lich. Scand. (1861) p. 233 p. p., Lich. Paris (1896) p. 99. *L. incusa* Fr. Syst. Orb. Veg. (1825) p. 286 sec. Th. Fr., haud Ach. Syn. Lich. (1814) p. 33 (sec. specim. orig. n. 152 a, a Schleich. missum, ad *Acarosporam fusc.* var. *smaragdulam* pertinens, conf. etiam Th. Fr. l. c. p. 615). *Verrucaria cinereoatra* Hoffm. Deutschl. Fl. II (1796) p. 182 ad *L. atroalbum* Wulf. spectat.

Thallus crustaceus, uniformis, areolatus aut verrucosus, fuscescens aut cervinus aut olivaceus aut cinerascens, vulgo haud pruinosis, esorediatus, intus albus, nec KHO, nec jodo reagens, hypothallo nigricante. Apothecia sat parva, vulgo

thallum subaequantia, nigra, nuda, disco plano, vulgo haud papillato, margine sat tenui, persistente aut demum excluso. Perithecium intus rubricosum, KHO solutionem luteam haud effundens. Epithecium vulgo rubricosum et KHO violascens. Sporae 8-nae, demum fusco-nigricantes, long. vulgo 0.028—0.030 (0.022—0.038), crass. 0.012—0.016 mm, 1-septatae.

Distr. Ad rupes et saxa, praesertim granitica, gneissacea et dioritica, frequenter toto territorio.

F. vulgaris (Koerb.) Vain.; Th. Fr. Lich. Scand. II (1874) p. 614 p. p. *Buellia badioatra* *a. vulgaris* Koerb. Syst. Lich. Germ. (1855) p. 223 p. p. *L. badioatra* f. *vulgaris* Vain. Adj. Lich. Lapp. II (1883) p. 127.

Thallus verrucosus aut areolatus, fuscescens aut cinereo-fuscescens aut obscure fuscescens, haud pruinosus, verrucis areolisque saepe rotundatis. Apothecia verrucis thalli immixta.

Distr. Frequenter proveniens.

Thallus est valde variabilis, sat crassus aut tenuis, areolis verrucisque convexis aut planis, contiguus aut dispersis (= f. *subiculosa* Arn.), rotundatis aut p. p. angulosis, laevigatis. Apothecia vulgo sat crebra aut irregulariter aggregata, lat. circ. 0.4—1.2 mm, interdum thallum leviter superantia, margine haud aut leviter prominente, partibus rubricosis KHO pulchrius coloratis. Perithecium rubricosum-fuligineum. Hypothecium vulgo rubricosum-fuligineum, interdum subfulvo-fuscescens. Epithecium vulgo rubricosum. Paraphyses cellulis oblongis aut parce ellipsoideis, apice parum incrassatis, gelatinam sat abundantem percurrentes. Sporae primum decoloratae, dein mox fusciscentes aut aëruginosae deindeque fusciscentes, medio saepe constrictae, strato gelatinoso sat tenui vulgo indutae. Gonidia cystococcoidea, globosa aut subglobosa, simplicia, diam. 0.006—0.015 mm, membrana sat tenui, vacuolis lateralibus.

F. rivularis (Flot.) Th. Fr. l. c. p. 613. *Buellia badioatra* *β. rivularis* Flot. in Koerb. Syst. Lich. Germ. (1855) p. 223. *Buellia rivularis* Arn. Lich. Tirol III (1868) p. 953, XXI (1880) p. 142. *Catocarpus atroalbus* f. *rivularis* Arn. Lich. Tirol XXX (1897) p. 31. *C. atroalbus* **C. rivularis* Arn. Labrador (1896) p. 15. *L. badioatra* f. *rivularis* Vain. Adj. Lich. Lapp. II (1883) p. 128.

Exs. Schaer. Lich. Helv. Exs. VIII (1828) n. 179 (sec. Koerb. l. c.). — Koerb. Lich. Sel. Germ. IV (1856) n. 105 (sec. Koerb.). — Nyl. Lich. Mont-Dore (1856) n. 53. — Hepp Flecht. Eur. IV (1867) n. 753.

Thallus vulgo fuscescens, haud pruinosis, areolatus, areolis vulgo sat laevigatis, angulosis et undulato-subcrenulatis, demum sat latis squamaeformibusque.

Distr. Ad saxa et lapides praesertim in rivulis, interdum etiam in campis herbidis et ericetis, locis numerosis collecta.

Thallus modice incrassatus aut crassus, areolis planis aut raro demum convexus, circ. 3—0.7 mm latis, contiguus aut raro supra hypothallum nigrum dispersis, obscure fusciscentibus aut subcervinis. Apothecia lat. circ. 1—0.7 mm (—1.5 mm sec. Th. Fr.), thallum haud aut raro leviter superantia, margine vulgo sat tenui, haud aut leviter prominente. Perithecium rubricosum-fuligineum. Hypothecium rubricosum- aut fusco-fuligineum. Hymenium circ. 0.120 mm crassum. Epithecium rubricosum aut rubricosum-fuligineum aut raro olivaceum fusciscentis. Sporae long. 0.026—0.038, crass. 0.014—0.016 mm, demum fusciscentes, medio vulgo constrictae.

F. tracheia Vain. *Lecidea badioatra* f. *tracheia* Vain. Adj. Lich. Lapp. II (1883) p. 128. *L. badioatra* **L. cervicolor* Nyl. in Brenner Bidr. Høgl. Lafv. (1885) p. 111.

Thallus cervinus aut partim glauco-cinereus aut subolivaceus, haud pruinosis, rimosis- vel areolato-diffractus, areolis verruculosis-inaequalibus.

Distr. Kb.: Ad saxa granitica in flumine ad Saramo in Nurmecum Lecanora lacustri. OKaj.: Ad saxa gneissacea in Kajaani (K. P. Malmgren). N.: Ad rupem porphyricam in Kappelniemi Hoglandiae (M. Brenner, „**L. cervicolor*“).

Areolae thalli e verruculis 0.15—0.3 mm latis, connatis, constantes. Apothecia lat. circ. 0.4—0.9 mm, subinnata, haud prominentia, tenuiter marginata aut demum immarginata. Perithecium rubricosum-fuligineum. Hypothecium fusco-nigriscentis. Sporae long. circ. 0.028—0.036, crass. 0.014—0.016 mm, demum fusco-nigriscentes. Hymenium jodo caeruleiscentis. — Proxima est f. *rivulari*.

F. subinnata Vain. *Lecidea badioatra* f. *subinnata* Vain. Adj. Lich. Lapp. II (1883) p. 127.

Thallus areolatus, areolis circ. 1—0.3 mm latis, planis vel planiusculis, angulosis, fusciscentibus vel cinereo-fusciscentibus, haud pruinosis, laevigatis. Apothecia areolis thalli subinnata.

Distr. Supra saxa granitica et gneissacea in montibus et in rivulis pluribus locis.

Est forma intermedia inter f. *vulgarem* et f. *rivularem*. Thallus areolis contiguus, modice incrassatis aut sat crassis. Apothecia lat. circ. 0.4—1.3 mm, immarginata aut marginata. Epithecium rubricosum. Sporae primum decoloratae, dein olivaceae, demum fusco-nigriscentes, long. circ. 0.026—0.033, crass. 0.013 mm.

F. *atroalba* (Flot.) Malme in sched. Lich. Suec. Exs. VII (1910) n. 171. *Lecidea atroalba* Nyl. Lich. Scand. (1861) p. 233 p. p. *L. badioatra* f. *atroalba* Vain. Adj. Lich. Lapp. II (1883) p. 129. *Rh. badioatrum* β. *vulgaris* Th. Fr. Lich. Scand. II p. 614 p. p.

Thallus verrucosus aut rarius areolatus, verrucis areolisve convexis aut rarius planis, subcinerascentibus, rotundatis aut rarius angulosis, laevigatis, haud pruinosis. Apothecia verrucis thalli immixta.

Distr. Sat frequenter proveniens.

In var. *vulgarem* saepe transit. Thallus sat crassus aut tenuis, areolis verrucisque circ. 0.8—0.3 mm latis, contiguus aut dispersis. Apothecia lat. circ. 0.8—0.5 mm, thallum haud superantia aut demum leviter prominentia, disco plano aut rarius demum convexo, margine prominente aut demum excluso. Epithecium rubricosum. Sporae demum fuscесcentes.

F. *glaucescens* (Naeg.) Vain. *Lecidea confervoides* γ. *glaucescens* Naeg. (man.) in Hepp Flecht. Eur. I (1853) tab. VI n. 34 (in herb. meo), haud **Rh. glaucescens* Th. Fr. l. c. p. 621.

Thallus verrucosus aut subareolatus, verrucis areolisve convexis vel depresso-convexis aut raro planiusculis, vulgo rotundatis, cinerascentibus aut sublivido-cinerascentibus, tenuissime subpruinosis, laevigatis, supra hypothallum nigrum dispersis. Apothecia verrucis thalli immixta.

Distr. Supra lapides et rupes graniticas ad Piililä in Korpilahti et Kanavuori in parocia Jyväskylä in Tb. (Vain.).

Thallus modice incrassatus, verrucis areolisve 0.8—0.2 mm latis. Apothecia lat. circ. 0.8—0.5 (—1) mm, thallum haud superantia aut interdum leviter prominentia, disco plano, margine vulgo prominente. Epithecium, hypothecium et perithecium rubricoso-fuligineum, KHO distinctius purpureum vel purpureo-fuligineum. Hymenium circ. 0.120 mm crassum. Sporae demum fuscесcentes. Proxima f. *subiculosae* Floerk. in herb. (*Catocarpus atroalbus* f. *subiculosus* Arn. Lich. Tirol XXIV, 1889, p. 253), „glebis thalli fuscidulo-cinerascentibus, dispersis“ descriptae. Schedulae speciminis ad Piililä lecti Nyl. a. 1874 adscripsit „*L. atroalba* vergens in *roridam*, quae vix quidem est vera varietas, sed sola forma ejusdem“. Conidia „bacillaria, long. 0.010—0.012, crass. 0.0007 mm“ (conf. Nyl. Lich. Paris, 1896, p. 99), filiformia, recta, apicibus affixa sterigmatum brevium simplicium aut bicellulorum (sec. annot. et icon. in sched. fragmenti ejusdem speciminis in herb. Nyl.).

F. *agglomerata* Vain. *Lecidea badioatra* f. *agglomerata* Vain. Adj. Lich. Lapp. II (1883) p. 128.

Thallus subareolatus, areolis planis aut depresso-convexis, vulgo rotundatis, livido-albidis, tenuissime pruinosis, laevigatis, contiguis, proliferationibus e crusta emoriente enatis renovatus, laxè affixus, hypothallo indistincto (emoriente). Apothecia lat. vulgo 0.4—0.6 (—0.8) mm, aggregata et e proliferationibus ex apotheciis emorientibus enatis formata, plana, tenuiter marginata.

Distr. In latere rupis graniticae ad Ruoptuinvaara in reg. pini-fera in LIn. (Vain.).

Thallus areolis circ. 0.2—0.8 mm latis, modice incrassatis. Epithecium rubricoso-fuligineum. Sporae demum fuscæ, long. 0.022—0.028, crass. 0.012—0.016 mm.

30. Rh. Copelandi (Koerb.) Th. Fr.

Lich. Scand. II (1874) p. 615 p. p. *Buellia Copelandi* Koerb. Zweite Deutsch. Pol. Exp. (1874) p. 79. *Lecidea Copelandii* Stizenb. Lich. Hyperb. (1876) p. 47. *L. badioatra* **L. Copelandi* Vain. Adj. Lich. Lapp. II (1883) p. 129. *L. Copelandi* Nyl. En. Lich. Fret. Behr. (1888) p. 58; Vain. Lich. Nov. Semlja (Beibl. Hedwigia 1898) p. 86.

Thallus crustaceus, uniformis, verrucosus aut areolatus, areolis verrucisve planis aut convexis, cinerascentibus aut raro subfuscescentibus, laevigatis, esorediatus, intus albus et KHO lutescens, jodo non reagens, hypothallo nigricante. Apothecia vulgo mediocria, raro sat parva, areolis immixta, demum prominentia, nigra, nuda, primum plana, demum vulgo depresso aut bene convexa, haud papillata, margine modice incrassato aut raro sat tenui, persistente aut rarius demum excluso. Perithecium KHO crystallæ rubra acicularia haud formans. Epithecium vulgo olivaceo- aut aeruginoso-fuligineum. Sporae 8-nae, demum aeruginoso-obscuratae aut raro demum fusco-nigricantes, vulgo long. 0.020—0.025 (0.018—0.034), crass. 0.009—0.014 mm, 1-septatae.

Distr. Ad rupes graniticas, granuliticas, dioriticas et schistosas crescit. OKaj.: Lehtovaara in Kianta (Vain.). Kuus.: In reg. subalp. montium Ukonvaara et Nuorunen (Vain.). KKER.: Reg. subalp. montis Kivakka (Vain.). LIn.: Suoloselkä (f. hypoleuca, conf. p. 330).

Thallus modice incrassatus aut sat crassus, verrucis areolisque 0.2—0.5 (—1) mm latis, rotundatis aut angulosis, contiguis, haud pruinosis, sed epithallo vulgo subtilissime diffracto, ita ut

thallus subpruinosis apparet, opacus, intus KHO lutescens deindeque fulvescens (videas infra). Apothecia lat. 1—0.7 (—1.8) mm (minora in f. hypoleuca), sat crebra aut partim aggregata aut dispersa. Perithecium fusco-rubricosum, KHO vulgo solutionem rubricosam effundens. Epithecium KHO distinctius aeruginosum. Hymenium circ. 0.140 mm crassum. Sporae medio vulgo constrictae, strato gelatinoso sat crasso vulgo indutae. Conidia filiformia, rectiuscula, long. 0.010—0.012 mm (sec. Th. Fr.). Gonidia cystococcoidea.

F. hypoleuca Vain. *L. badioatra* **L. Copelandi* f. *hypoleuca* Vain. Adj. Lich. Lapp. II (1883) p. 129.

Apothecia minora, lat. circ. 0.8—0.5 (—0.8) mm. Thallus tenuior, verrucis 0.2—0.3 mm latis, cinereoalbidis albidisve, intus KHO lutescentibus.

Distr. In reg. subalp. jugi Suolonselkä in LIn. (Vain.).

Verrucae haud pruinosae, subnitidae, laevigatae, contiguae et partim subdispersae. Apothecia demum prominentia, margine sat tenui, saepe demum excluso. Perithecium rubricosum-fuligineum aut partim intus pallidum, KHO non reagens. Hypothecium rubricosum-fuligineum. Epithecium aeruginoso- aut olivaceo- aut partim rubricosum-fuligineum (in eodem apothecio, praesertim in partibus submorbosis), KHO parum reagens. Sporae demum aeruginoso-nigricantes, long. 0.020—0.026, crass. 0.010—0.011 mm, medio constrictae, strato gelatinoso crasso.

F. pallidofuscescens Vain.

Thallus verrucis pallido-fuscescentibus, haud pruinosis nitidisque aut parce cinerascenti-subpruinosis.

Distr. Ad rupem dioriticam in regione montis Ukonvaara in Kuus. (Vain.).

Thallus verrucis 0.8—0.3 mm latis, laevigatis, intus KHO solutionem luteam effundentibus, jodo haud reagentibus. Epithecium fuscescens (simile in „*B. Copelandi*“ Koerb. sec. descr.). Sporae nigricantes, 1-septatae. Non sit autonoma species.

Obs. 1. In specimine supra rupem dioriticam littoralem ad Koroppi in Karelia Vien. occ. a me collecto (etiam museo Voronesch. misso) reactiones KHO productae variabiles sunt. Perithecium variat intus dilutius coloratum et solutionem lutescentem effundens. Thallus medulla KHO lutescente aut solutionem dilute lutescentem effundente et demum dilutissime rubescente. Ad *Rh. hyperboreum* accedens.

Obs. 2. *Rh. badioatrum* **Jemtlandicum* Malme (n. subsp.), Lich. Suec. Exs. XVII (1914) n. 422, variatio insignis est *Rh. Copelandi*, thallo fuscescente, areolis subplanis, 1.2—0.5 mm latis, angulosis, intus KHO lutescentibus, perithecio aeruginoso-nigricante fuscove (in eodem apo-

thecio), KHO non reagente, epithecio aeruginoso-olivaceo, sporis aeruginoso-nigricantibus aut parce fusciscentibus. In Fennia nondum collecta. Non est *Catillaria Jemtlandica* Th. Fr. Lich. Scand. p. 580.

31. *Rh. hyperboreum* Vain.

Lecidea hyperborea Vain. Lich. Nov. Semlj. (Beibl. Hedwigia 1898 n. 3) p. 86. *Rh. Copelandi* Th. Fr. Lich. Scand. II (1874) p. 615 p. p. *Catocarpus Copelandi* Arn. Lich. Tirol XIX (1878) p. 288, Labrador (1896) p. 16. „*C. badioater* var. *illa alpina*, quam in Lich. Tirol XIV p. 445 n. 74 memoravi“, sec. Arn. l. c. XVII (1877) p. 536.

Exs. Malme Lich. Suec. Exs. XI (1912) n. 275, XVII (1914) n. 422.

Thallus crustaceus, uniformis, verrucosus aut areolatus, areolis verrucisve cinereis, vulgo laevigatis, haud pruinosis, esorediatis, intus albis, KHO lutescentibus deindeque mox rubescentibus, jodo non reagentibus, hypothallo nigricante. Apothecia mediocria aut sat parva, areolis thalli immixta, demum prominentia, nigra, nuda, primum plana, demum vulgo convexa, haud papillata, margine modice incrassato aut sat tenui, persistente aut demum excluso. Perithecium KHO crystallina acicularia rubra formans. Epithecium aeruginoso-nigricans. Sporae 8-nae, demum aeruginoso-nigricantes, long. 0.021—0.030, crass. 0.009—0.012 mm, 1-septatae.

Distr. In rupe schistosa in reg. betulina ad Kōngäs prope Mare Glaciale in LIn. („*L. Copelandi“ in Vain. Adj. Lich. Lapp. II p. 129). In rupe granitica ad Jokonga in LMur. (cum *L. fuscoatra* in Fellm. Lich. Arct. n. 191, n. 10007 in herb. Nyl.).

Thallus sat crassus aut tenuis, verrucis areolisque 0.8—0.3 mm latis, rotundatis aut angulosis, convexis aut planis, vulgo leviter nitidis, KHO guttulas minutissimas granuliformes rubras formantibus. Apothecia lat. 1.4—0.5 mm, sat crebra aut dispersa. Perithecium extus rubricosum-fuligineum, intus sordide pallidum albidumve et KHO solutionem luteam, crystallina acicularia rubra formantem, effundens. Hymenium circ. 0.140 mm crassum. Epithecium KHO non reagens. Hypothecium fusco-nigricans, KHO sordide subviolascens-nigricans. Sporae medio constrictae, strato gelatinoso sat crasso indutae. Gonidia cystococcoidea, globosa

aut subglobosa, diam. 0.008—0.006 mm, membrana sat tenui, saepe autosporas nonnullas continentia.

32. *Rh. cinereonigrum* Vain. (n. sp.).

Thallus crustaceus, uniformis, verrucosus, verrucis majusculis, cinerascentibus, haud pruinosis, esorediatis, demum verruculoso-inaequalibus, intus albis et KHO lutescentibus, jodo non reagentibus, hypothallo nigricante. Apothecia sat parva aut fere mediocria, areolis thalli immixta aut latere iis connata, thallum haud superantia, nigra, nuda, disco plano, aut demum depresso-convexo, margine sat tenui aut fere modice incrassato, persistente. Perithecium KHO non reagens. Epithecium rubricosum-fuliginum. Sporae 8:nae, nigricantes aut fusco-nigricantes, long. 0.028—0.035, crass. 0.014—0.017 mm, 1-septatae.

Distr. Ad saxum diabasicum in Kuusto in Tammela in Ta. (A. Kullhem).

Verrucis thalli majoribus, demum inaequalibus, apotheciis haud prominentibus, et colore epithecii sporarumque a *Rh. Copelandi* differt. Thallus crassus, verrucis 1.6—1 (—0.5) mm latis, depresso-convexis, opacis, sat obscure cinerascentibus, dispersis, sat laxe affixis, saepe sat rotundatis, medulla KHO demum fulvescente, hypothallo demum evanescente. Apothecia lat. 1.2—0.7 mm, dispersa. Perithecium rubricosum-fuliginum. Hymenium circ. 0.150—0.160 mm crassum. Epithecium KHO pulchrius rubricosum. Hypothecium rubricosum aut fuscescens, KHO non reagens. Sporae medio constrictae, strato gelatinoso modice incrassato.

33. *Rh. Hochstetteri* (Koerb.) Vain.

Catocarpus Hochstetteri Koerb. Parerg. Lich. 3 Lief. (1861) p. 195 (videas p. 333). *Lecidea* Vain. Adj. Lich. Lapp. II (1883) p. 619, Lich. Exp. Vegae Pitlekai (1909) p. 115. *L. atroalba* var. *chlorospora* Nyl. Obs. Lich. Holm. (N. Bot. Not. 1853) p. 97 (6), Lich. Scand. (1861) p. 233 f. 10 (sec. specim. orig. n. 10047 et 10060 in herb. Nyl.), nomen ineptum. *Buellia chlorospora* Hellb. Ner. Laffl. (1871) p. 104. *Lecidea colludens* Nyl. Fl. 1870 p. 38. *L. atroalba* var. *applanata* Fr. Summ. Veg. Scand. (1846) p. 116 p. p. (videas p. 335), haud *L. applanata* Chev. Fl. Gén. Par. I (1826) p. 565. *Rhizocarpum applanatum* Th. Fr. Lich. Scand. II (1874) p. 618. *Catocarpus applanatus* Arn. Lich. Tirol XX (1879) p. 373, XXIII (1887) p. 101.

Thallus crustaceus, uniformis, subcontinuus aut rimoso-diffractus areolatusve aut raro verrucosus, aut dispersus, cinerascens aut lividus pallidusve aut rufescens, haud pruinosis, esorediatus, nec KHO, nec jodo reagens, hypothallo nigricante. Apothecia vulgo mediocria, thallum haud superantia aut demum prominentia, nigra, nuda, disco plano, haud papillato, margine tenui aut modice incrassato, persistente aut demum excluso. Epithecium olivaceum aut aeruginosum. Sporae 8:nae, decoloratae aut demum obscuratae, vulgo long. circ. 0.019—0.029, crass. 0.009—0.014 mm, 1-septatae.

Distr. Supra rupes et saxa, granitica, gneissacea, porphyrica, dioritica, passim, septentrionem versus rarescens.

F. colludens (Nyl.) Vain. *L. colludens* Nyl. Fl. 1870 p. 38 p. p. (sec. determ. et specim. cit. in herb. Nyl.). *L. Hochstetteri* var. *colludens* Vain. Adj. Lich. Lapp. II (1883) p. 132. *Catocarpus Hochstetteri* Koerb. l. c. (conf. Stizenb. Lich. Helv., 1882, p. 200). *Rh. applanatum* f. *Hochstetteri* Th. Fr. l. c. p. 619.

Exs. Havaas Lich. Norv. Exs. (1904) n. 202. — Norrl. et Nyl. Herb. Lich. Fenn. cont. (1921) n. 728.

Thallus tenuis vel tenuissimus, laevigatus, continuus rimulosusve aut dispersus, rufescens aut pallidus aut subcervinus. Apothecia margine tenui.

Distr. Praesertim in lateribus subumbrosis rupium saxorumque crescit. In provinciis meridionalibus et adhuc in Karelia boreali passim. In Ekostrov ad Imandra in LIm. (N. I. Fellman).

Apothecia lat. 1.2—0.5 mm, thallum haud superantia aut prominentia. Perithecium rubricosum-fuligineum. Hypothecium sordide purpureo- aut fusco-fuligineum. Hymenium circ. 0.100 mm crassum, sat parce gelatinosum. Epithecium aeruginoso-fuligineum. Sporae decoloratae aut demum dilute aeruginosae aut subfusciscenti-obscuratae, long. 0.018—0.025, crass. 0.010—0.012 mm (sec. Nyl.), strato gelatinoso tenui indutae. Conidia „bacilliformia, recta, long. 0.0035—0.0006, crass. 0.0005 mm“ (sec. annot. Nyl. in n. 10047 et 10070).

F. caesiocinerascens Vain. *L. Hochstetteri* f. *caesiocinerascens* Vain. Adj. Lich. Lapp. II (1883) n. 132.

Thallus tenuis, laevigatus, subcontinuus, rimulosus, cinerascens. Apothecia margine tenui.

Distr. Pluribus locis collecta.

Thallus paullo crassior, quam in f. *colludente*. Epithecium sordide aeruginosum. — Huic formae proximus est Zwackh Lich. Exs. (1853) n. 202 (in f. *incrassatam* transiens).

F. *infernula* (Nyl.) Vain. *Lecidea infernula* Nyl. Lich. Nov. Fret. Behr. (Fl. 1885) p. 440, Enum. Lich. Fret. Behr. (Bull. Soc. Linn. Norm. 4. ser. I, 1888) p. 58.

Thallus tenuis aut tenuissimus, laevigatus, dispersus, areolis parvis, cinerascens. Apothecia minora, margine tenui.

Distr. Ad lapides et rupes (diabasica). Kuus.: Ad Kitkajoki (F. Silén). LENont.: Ad Kilpisjärvi („*L. colludens* minor“ sec. Nyl. in Norrl. Ber. Torn. Lappm. p. 340).

Est intermedia inter f. *caesiocinerascentem* et f. *dispersellam*. Areolae thalli lat. vulgo 0.3—0.2 mm, vulgo planae. Hypothallus nigricans. Apothecia lat. 0.6—0.3 mm. Perithecium fuligineum. Hypothecium rubricosum-fuligineum. Hymenium circ. 0.110 mm crassum, sat parce gelatinosum, parte superiore saepe partim leviter aeruginosum, epithecio subolivaceo-fuligineo. Paraphyses increbre septatae, vix 0.0015 mm crassae, apice 0.003—0.004 mm crassae. Sporae decoloratae aut demum dilute fusciscenti-pallidae, 1-septatae, long. 0.018—0.027, crass. 0.010—0.014 mm, strato gelatinoso tenui indutae. In specim. Sibiricis sec. Nyl. sporae long. 0.014—0.016, crass. 0.006—0.008 mm, demum obscuratae, gel. hym. jodo caerulescens, dein sublutescens. *L. decinerascens* Nyl., Fl. 1885 p. 445, Enum. Lich. Fret. Behr. (1888) p. 14, sec. specimina orig. a *L. infernula* Nyl. nulla nota differens, sporis incoloribus, long. 0.012—0.023, crass. 0.007—0.011 mm, gel. hym. jodo bene caerulescente, dein vinose fulvescente, a Nyl. descripta est.

F. *dispersella* Vain. *L. Hochstetteri* var. *dispersella* Vain. Adj. Lich. Lapp. II (1883) p. 132.

Thallus obsoletus, vix ullus visibilis aut e verruculis minutissimis, dispersis constans, hypothallo obsoleto. Apothecia minora, margine tenui.

Distr. Ad lapides in reg. subalpina montis Iivaara in Kuus. (Vain.).

Medulla KHO aut jodo non reagens. Epithecium aeruginoso- aut olivaceo-fuligineum. Paraphyses apice incrassatae. Sporae 1-septatae, decoloratae, long. circ. 0.019, crass. 0.010 mm.

F. *incrassata* Vain. *L. Hochstetteri* f. *incrassata* Vain. Adj. Lich. Lapp. II (1883) p. 131. *Rhizocarpon Massalongii* Malme Lich. Suec. Exs. V (1909) n. 124, XI (1912) n. 274.

Exs. Fr. Lich. Suec. Exs. XIII (1827) n. 382 C (sec. Th. Fr.). — Schaer. Lich. Helv. Exs. VIII (1828) n. 180 B (herb. Nyl.). — Arn. Lich. Exs. (1879) n. 813. — Malme l. c.

Thallus modice incrassatus, areolatus aut rarius subverrucosus. Apothecia vulgo demum thallum superantia, margine modice incrassato aut raro tenui.

Distr. Locis apricis ad rupes et saxa. Locis numerosis collecta. LIn.: Edleljärvenpahta (F. Silén), Hammastunturi (Vain.). LKem.: Keimiotunturi in Muonioniska (J. P. Norrlin). Etiam in prov. mediis et meridionalibus collecta.

Thallus cervinus aut raro cinerascens albidusve, areolis circ. 0.8—0.2 mm latis, planis aut rarius convexis verrucaeformibusque, laevigatis aut raro verruculoso-inaequalibus, contiguis. Apothecia lat. 1.3—0.5 mm. Perithecium fusco-fuligineum. Hypothecium fuscescens aut partim rubricosum. Hymenium circ. 0.110 mm crassum. Epithecium fuligineum aut olivaceo- vel aeruginoso-fuligineum, KHO non reagens. Paraphyses crass. 0.0015 mm, apice 0.003—0.004 mm. Sporae long. 0.018—0.029, crass. 0.003—0.014 mm, decoloratae aut demum fumoso-olivaceae aut morbose dilute fuscescens. Gonidia cystococcoidea, simplicia, globosa, diam. 0.007—0.012 mm, membrana sat tenui.

Obs. 1. *F. dealbata* (Nyl. in sched.), ad rupem porphyricam in Keimiotunturi in Kittilä in LKem. ab J. P. Norrlin collecta, thallo instructa est modice incrassato, albido, verrucoso, verrucis 0.2—0.5 mm latis, contiguis, hypothallo vix distincto, apotheciis prominentibus, 1—0.7 mm latis, margine fere modice incrassato, epithecio olivaceo-fuligineo, hymenio superne partim aeruginoso, hypothecio fusco aut partim rubricosco-fuscescens, perithecio fuligineo, sporis 1-septatis, decoloratis aut morbose dilute fusco-pallescentibus.

Obs. 2. *Catillaria Massalongii* Koerb., Parerg. Lich. 3 Lief. (1861) p. 165, spectat ad „*L. confervoidem* β . *concretam*“ Schaer. (Lich. Helv. Spic. III, 1828, p. 128), ad Gurten in Helvetia collectam (Schaer. Lich. Helv. Exs. n. 177 p. p., ad *Rhiz. obscuratum* Mass. in herb. D.C. pertinenens), et „lamina apothecii fuscescens et hypothecio vix colorato“ a Koerb. descripta est, quare hoc nomen ad hanc speciem designandam haud bene adhibetur.

Obs. 3. *L. atroalba* var. *applanata* Fr. (Summ. Veg. Scand., 1846, p. 116) spectat ad Fr. Lich. Suec. Exs. n. 382 (A, B, C), quorum A ad *Rh. plicatilem* (sec. Th. Fr. l. c. p. 631), B ad *Rh. badioatrum* (sec. Th. Fr. l. c. p. 614) et *Rh. distinctum* (sec. Arn. Lich. Fränk. Jur. p. 200) et tantum C ad *Rh. Hochstetteri* (sec. Th. Fr. l. c. p. 618) pertinet, quare hoc nomen prioritatem ad hanc speciem designandam non habet (conf. Tuck. Syn. North Am. Lich. II p. 100, Nyl. Lich. Jap. p. 82).

34. **Rh. cinereovirens** (Müll. Arg.) Vain.

Catillaria cinereovirens Müll. Arg. Fl. 1868 p. 49. *Rhizocarpon ignobile* Th. Fr. Lich. Scand. II (1874) p. 619. *Lecidea ignobilis* Vain. Adj. Lich. Lapp. II (1883) p. 132. *Catocarpus* Arn. Lich. Exs. (1887) n. 1241. *Lecidea eupetraeoides* Nyl. Fl. 1875 p. 12. *L. seducta* Nyl. in Zwackh Lich. Exs. (1880) n. 608, Fl. 1881 p. 5; Zwackh Lich. Heidelb. (1883) p. 57. *Buellia concreta* Zwackh Enum. Lich. Heidelb. (Fl. 1862) p. 522 (nec Koerb., nec Ach.).

Exs. Zwackh l. c. — Norrl. et Nyl. Herb. Lich. Fenn. VII (1882) n. 344. — Arn. Lich. Exs. (1887) n. 1241. — Malme Lich. Suec. Exs. VIII (1910) n. 200.

Thallus crustaceus, uniformis, verrucosus, albidus aut cinerascens, haud pruinosis, esorediatus, KHO lutescens deindeque rubescens, jodo haud reagens, hypothallo nigricante aut raro cinerascens vel indistincto. Apothecia sat parva, thallum haud superantia, nigra, nuda, disco plano aut rarius demum depresso-convexo, margine tenui, vulgo persistente. Epithecium aeruginoso-nigricans aut raro partim rubricosus-fuliginosus. Sporae 8-nae, decoloratae aut rarius demum obscuratae, long. 0.015—0.024 (—0.026), crass. 0.006—0.009 mm, 1-septatae.

Distr. Ad lapides, rupes et saxa (granitica) in campis herbidis ericetisque, pratis et littoribus aliisque locis apertis, raro ad saepimenta lignea vetusta. N.: Meilans prope Helsingforsiam (Vain.). Ka.: Vanha-Viipuri et prope Papula Viburgi (Vain. Lich. Vib. p. 68). Ta.: Prope Lahti (Vain.), Onkisalo et Jänissaari in Luhanka (Vain. Fl. Tav. Or. p. 117). Sa.: Savonlinna (O. Carlenius). Tb.: Norola in par. Jyväskylä (Vain. l. c.). Sb.: Selkiinmäki in Pieksämäki (Norrl. l. c. n. 344). Kb.: Passim (sec. Vain. Adj. Lich. Lapp. II p. 132), collecta aut annotata ad Niska in Enontaipele, ad Nevala, Koriseva et Matovaara in Lieksa, ad Jännevaara, Kynsisaari, Lipinlahti, Kylmälahti in Nurmes. OKaj.: Passim (sec. Vain. l. c.), collecta aut annotata ad Lapinsalmi in Kuhmo, ad Lentiira, Kylmäjärvi, Saunaniemi, Templum et Hossa in Kianta. Kuus.: In reg. abietina montis Näränkäväära (Vain. l. c.). KKER.: In reg. subalp. montis Päänuorunen (Vain. l. c.). LIn.: In reg. subalp. montis Hammastunturi (Vain. l. c.).

Thallus modice incrassatus aut sat crassus, verrucis vulgo circ. 0.2—0.4 mm (raro — 1.5 mm) latis, vulgo bene convexis, laevigatis, saepe rotundatis, contiguus aut raro dispersis aut partim confluentibus, KHO crystallae rubrae aciculariae haud formans. Apothecia sat crebra aut haud raro in seriebus irregularibus aut partim circulos defectos formantibus disposita, lat. 1.2—0.5 mm, disco haud papillato, margine interdum leviter prominente. Perithecium in margine extus nigricans, intus et subtus rubricosum. Hypothecium vulgo rubricosum-fuliginum. Hymenium circ. 0.100 mm crassum, jodo caeruleum. Epithecium vulgo fuliginum aut aeruginoso- vel olivaceo-fuliginum, KHO distinctius aeruginosum. Paraphyses increbre septatae, gelatinum haud abundantem percurrentes. Sporae ellipsoideae oblongae aut p. p. subovoideae, saepe medio constrictae, 1-septatae aut parvisse 2-septatae, saepe strato gelatinoso indutae. Gonidia cystococcoidea, globosa, vulgo diam. 0.008—0.010 mm, membrana sat tenui.

F. subroridula Vain. *L. ignobilis* f. *subroridula* Vain. Adj. Lich. Lapp. II (1883) p. 133.

Thallus verruculis minutissimis, subcontiguus. Apothecia minora.

Distr. Ad rupem dioriticam in littore lacus Kylmäjärvi in Kianta (supra ind.).

Thallus albidus, verruculis vulgo 0.2—0.25 mm latis. Apothecia lat. 0.3—0.5 mm. Perithecium rubricosum-fuliginum. Hypothecium fusconigrum. Epithecium aeruginoso-fuliginum aut marginem versus rubricosum-fuliginum. Sporae long. circ. 0.020, crass. 0.008 mm.

F. asynna Vain. *L. ignobilis* f. *asynna* Vain. l. c.

Thallus dispersus. Apothecia leviter prominentia.

Distr. Ad rupem granuliticam in reg. subalp. montis Hammas-tunturi in LIn. (supra ind.).

Thallus verrucis circ. 0.2—0.3 mm latis, depresso-convexis tenuibusque, subalbidis, hypothallo parum conspicuo dispersoque. Apothecia crebra, lat. circ. 0.3—0.6 mm, saepe demum depresso-convexa et margine excluso. Hypothecium rubricosum-nigricans. Epithecium aeruginoso-fuliginum. Sporae diu subdecoloratae, 1-septatae, medio constrictae.

F. saepincola Vain. Lignicola.

Distr. Ad saepimentum ligneum prope Nevala in par. Lieksa in Kb. (supra ind.).

Thallus verrucis contiguus, circ. 0.4—0.5 mm latis, albidis aut subcinerascentibus, hypothallo parum distincto. Sporae decoloratae, long. circ. 0.019, crass. 0.008 mm, 1-septatae.

Obs. 1. *L. seducta* Nyl. (l. c.) est forma hujus speciei, tantum thallo subcervino ab ea differens. Thallus KHO praesertim intus lutescens deindeque rubescens, crystalli nulla rubra aciculariaque formans. In Germania collecta est.

Obs. 2. *C. cinereovirens* Müll. Arg. (l. c.) sec. specim. orig. in herb. Nyl. non differt a *Rh. ignobili* Th. Fr., thallo instructa cinerascens, KHO lutescente deindeque rubescens. — *L. eupetraeoides* Nyl. in En. Lich. Fret. Behr. (1888) p. 59 huc non pertinet, areolis thalli majoribus, pallidis, dispersis, intus jodo caerulescentibus, a *Rh. ignobili* differens.

35. *Rh. polycarpum* (Hepp) Th. Fr.

Lich. Scand. II (1874) p. 617. *Lecidea confervoides* ð. *polycarpa* Hepp Flecht. Eur. I (1853) n. 35. *Catocarpus polycarpus* Arn. Lich. Tirol XV (1876) p. 385, Lich. Fragm. XXIX (1888) p. 18, Lich. Münch. (1891) p. 93, Labrador (1896) p. 16. *C. confervoides* Krempelh. Lich. Bay. (1861) p. 200; Arn. Lich. Fragm. XII (Fl. 1871) p. 147 (haud *Rh. confervoides* D.C., conf. p. 292). *Lecidea atroalbicans* Nyl. Fl. 1875 p. 363, Lich. Pyr. Or. Obs. Nov. (1891) p. 37; Vain. Adj. Lich. Lapp. II (1883) p. 130, Exp. Antart. Belge (1903) p. 33, Lich. Exp. Vegae Pitlekai (1909) p. 115.

Exs. Hepp Flecht. Eur. I (1853) n. 35. — Arn. Lich. Exs. (1870) n. 437, (1873) n. 559 a—c, (1880) n. 852. — Zahlbr. Krypt. Exs. Vindob. III (1898) n. 265. — Havaas Lich. Norv. Exs. (1904) n. 201. — Malme Lich. Suec. Exs. VI (1909) n. 149, XV (1913) n. 374. — Harm. Lich. Loth. n. 1069 (sec. Lynge Ind. Lich. Exs. I p. 240).

Thallus crustaceus, uniformis, areolatus aut raro verrucosus, areolis verrucisque vulgo minutis, contiguis aut raro dispersis, fuscescentibus cervinisve aut cinerascens albidisve, haud pruinosis, esorediatis, KHO non reagentibus, jodo caerulescentibus, hypothallo nigricante. Apothecia sat parva, thallum haud superantia aut raro leviter prominentia, nigra, nuda, disco plano aut raro demum depresso-convexo, margine tenui, persistente aut demum excluso. Epithecium fuligineum aut rubricosum-fuligineum fuscescensve. Sporae 8-nae, decoloratae aut demum obscuratae, long. 0.018—0.030 mm (—0.034 mm sec. Nyl.), crass. 0.008—0.014 mm, vulgo 1-septatae.

Distr. Supra lapides et saxa, praesertim granitica, in campis herbidis et aliis locis apricis sat rare aut passim, raro etiam ad lignum vetustum et corticem Betulae, toto territorio provenit.

Thallus tenuis aut sat tenuis aut raro modice incrassatus, areolis 0.2—0.5 mm latis, angulosis, planis aut raro convexis et subrotundatis, vulgo laevigatis. Apothecia crebra, lat. 0.5—0.9 mm, margine haud aut interdum leviter prominente. Perithecium fusco-aut rubricosofuligineum. Hypothecium fuscescens aut rubricosonigricans, KHO non reagens. Epithecium fuligineum aut rubricosofuligineum aut fuscescens, KHO pulchrius rubricosum. Paraphyses parce ramoso-connexae, gelatinam abundantem percurrentes, apice leviter incrassatae. Sporae decoloratae aut demum glaucescentes vel dilute aeruginosae vel dilute fuscrescentes, medio saepe constrictae, strato gelatinoso crasso indutae, raro nonnullae 3-septatae. Conidia „cylindrica, recta, long. 0.010—0.012, crass. 0.001 mm“ (sec. Arn. Lich. Tirol XIII p. 242). Gonidia cystococcoidea, globosa aut subglobosa, diam. 0.007—0.012 mm, membrana sat tenui.

F. aspilioides Vain.

Thallus demum sat crassus, areolatus, areolis vulgo circ. 2—0.5 mm latis, angulosis, contiguus, planis, sat obscure cinerascens, demum leviter inaequalibus, jodo caerulescentibus, ad ambitum hypothallo distincto. Apothecia partibus crassioribus thalli innata et strato thallino imposita, ad ambitum thalli hypothallo imposita.

Distr. Ad lapidem graniticum loco aprico ventoso in littore marino ad Tervaniemi Viburgi [„*L. confervoides* (D.C.)“ in Vain. Lich. Vib. p. 68].

Hypothecium saepe sordide olivaceo-nigricans. Hymenium jodo persistenter caerulescens. Paraphyses crebre constrictae articulatae, apice subviolaceo-nigricantes et circ. 0.005 mm crassae. Sporae 1-septatae, diu decoloratae, demum sordide olivaceo-nigricantes fuscrescentes, long. 0.022—0.026, crass. 0.010—0.012 mm.

F. infuscata Vain. *Lecidea atroalbicans* f. *infuscata* Vain. Lich. Exp. Vegae Pitlekai (1909) p. 115.

Thallus testaceo- aut cervino-fuscrescens.

Distr. Pluribus locis collecta.

F. cinerascens Vain. *L. atroalbicans* f. *cinerascens* Vain. l. c.

Thallus subcinerascens, areolatus, supra hypothallum nigrum dispersus. Apothecia vulgo thallum superantia.

Distr. Ad saxa silacea et gneissacea collecta. KOn.: Tiudie (G. Selin). Kb.: Niska in Enontaipe (Vain.). LTul.: Kitofka (N. I. Fellman).

F. fallax Vain. *L. atroalbicans* f. *fallax* Vain. Adj. Lich. Lapp. II (1883) p. 131.

Thallus verrucosus, verrucis convexis, vulgo rotundatis, lat. 0.2—0.4 (—0.7) mm, albido-cinerascentibus, supra hypothallum nigrum crebre dispersis, apotheciis intermixtis.

Distr. Ad rupem gabbroiticam in reg. subalp. montis Kivakka in KKER. (Vain.).

Facie externa subsimilis **Rh. eupetraeo*. Thallus haud pruinosis, KHO non reagens, medulla jodo caerulescente. Apothecia thallum haud aut parum superantia, lat. 0.4 (—0.3) mm, disco plano, haud papillato, margine tenui, integro, haud aut leviter prominente. Epithecium rubricosum-fuligineum. Sporae 1-septatae, primum decoloratae, demum obscuratae, long. circ. 0.022—0.024, crass. 0.012—0.014 mm, strato gelatinoso crasso indutae.

F. recedens Vain. *L. atroalbicans* f. *recedens* Vain. Adj. Lich. Lapp. II (1883) p. 131.

Corticola. Thallus areolis vulgo convexis, saepe verrucaeformibus, contiguis, cervinis, modice incrassatis. Apothecia demum convexa, vulgo immarginata.

Distr. Ad corticem Betulae in regione Coniferarum montis Pyhätunturi in Sodankylä in LKEM. (Vain.).

Thallus KHO non reagens, medulla jodo caerulescente. Excipulum et hypothecium rubricosum-fuligineum. Epithecium sat dilute rubricosum. Hymenium circ. 0.110 mm crassum, jodo persistenter caerulescens. Sporae 1-septatae, decoloratae, long. circ. 0.025—0.030, crass. 0.010—0.011 mm, interdum strato gelatinoso crasso indutae.

F. rhododendri (Arn.) Vain. *Catocarpus polycarpus* f. *rhododendri* Arn. Lich. Exs. (1873) n. 559 a, b, (1875) c.

Thallus obscure cinerascens, areolis planis, vulgo contiguis. Apothecia plana. Sporae demum obscuratae.

Distr. Ad corticem Betulae in Alkkula in Ob. (E. Nylander). Ad saepimenta lignea in Tuusula in N. (Vain.) et in Asikkala in Ta. (J. P. Norrlin), ad pontes ligneos in pag. Lieksa in Kb. (Vain.) et ad Templum in Kuhmo in OKaj. (Vain.).

Thallus jodo caerulescens, KHO non reagens. Hypothecium fuscescens, KHO non reagens. Epithecium subfuscescens, KHO rubricosum. Sporae 1-septatae, decoloratae deindeque nigricantes, long. 0.018—0.024, crass. 0.009—0.010 mm. — Ab Arn. in Lich. Tirol XV (1876) p. 385 n. 33 (conf. XXI p. 142) „sporis incoloribus, olivaceis, fuscis, 0.027—0.034 mm longis, 0.012—0.015 mm crassis“ descripta est (ad corticem Rhododendri ferruginei in Tirolia collecta).

Provinciae phyto-geographicae, in mappa geographica indicatae.

In Fennia:

Ab.	= Regio Aboënsis.
Al.	= Alandia.
Ik.	= Isthmus Karelicus.
Ka.	= Karelia australis.
Kb.	= Karelia borealis.
KLad.	= Karelia Ladogensis (= Kl).
Kuus.	= Kuusamo (= Ks).
LEnont.	= Lapponia Enontekiensis (= L ^e).
LIn.	= Lapponia Inarensis (= Li).
LKem.	= Lapponia Kemensis.
N.	= Nylandia.
Oa.	= Ostrobothnia australis.
Ob.	= Ostrobothnia borealis.
OKaj.	= Ostrobothnia Kajanensis (= Ok).
Om.	= Ostrobothnia media.
Sa.	= Savonia australis.
Sb.	= Savonia borealis.
St.	= Satakunta.
Ta.	= Tavastia australis.
Tb.	= Tavastia borealis.

In Karelia Vienaënsi:

KKer.	= Karelia Keretina (= Kk).
KOl.	= Karelia Olonetsensis.
KOn.	= Karelia Onegensis.
KSv.	= Karelia Svirensis (ad KOl relata).
KTron.	= Karelia Transonegensis (= Kton).
KVien. occ.	= Karelia Vienaënsis occidentalis (= Kpoc).
KVien. or.	= Karelia Vienaënsis orientalis (= Kpor).

In Lapponia Kuollaënsi (s. Kolaënsi):

LIm.	= Lapponia Imandrae.
LMur.	= Lapponia Murmanica.
LPon.	= Lapponia Ponojensis (= Lp).
LTul.	= Lapponia Tulomensis (= Lt).
LVar.	= Lapponia Varsugae (= Lv).

ACTA
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53.



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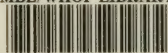
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53.

N:o

1. Vainio, Edv. A., Lichenographia Fennica II. Baeomycetaceae et Lecideales. Pag. 1-340 cum mappa geographica et explicatione ejusdem.

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